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WAGNER & CO. ...	COLLOTYPE REPRODUCTION OF A SILVER PRINT	February 4

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THE WORK OF THE NEW YEAR.

Photographers in this country have only just begun to realize the advantages to be secured by the use of plates made more orthochromatic by means of dyes or stains; and so keen is the commercial competition of the present day, that we may be sure that those commercialists who control the manufacture of dry plates will see that the rising demand for orthochromatic plates is supplied. Indeed, we may expect that before the end of the year, every plate purveyor will be in a position to supply more or less completely isochromatized (or orthochromatized) plates.

It is in the case of work by gas or lamp light that the advantage of the colour-stained plate is most considerable; and, indeed, with such plates as are now in the market—we allude specially to those sold by Dixon—portraiture by gaslight should become a very easy matter.

As the large class of over-leisured people in whom the human desire to do something stirs and unquiets, is not likely to be appreciably diminished during the coming year, we may expect an activity in the world of amateur photographers correspondingly to—and perhaps greater than—the activity of last year. So much the better, as real progress has hitherto been mainly in the hands of amateurs. We must, however, not lose sight of the fact that the neo-amateur is, to take him all round, not quite of the same stamp as the amateur of the old time. Twenty years ago any person who wished to produce photographs which should be prominently good had to labour hard, to deal with a number of difficult conditions, and had to produce each sensitive plate by a personal effort—a real effort and mental strain, because he knew that so many adverse conditions were watchfully striving against him. Moreover, when the plate was produced, it was useless unless the time of production were favourable to immediate use.

Now the amateur can buy his plates. He may store them ready for occasion to use in dark backs, or he may, instead, have a long band of sensitive material in his roller-slide. Easy it is, under these conditions, to make twenty exposures while the wet-plate maker would have been preparing a plate, and the scene might have been shifting into a commonplace not worth exposing upon. Perhaps this facility for negative making has caused a hundred times as many exposures to be made now as were made formerly, and possibly the output of good negatives may have been five-folded; but let us hope that, assuming this proportion to be approximately true, the ratio will be a somewhat different one during the coming year.

The great facilities now existing for the production of technically good photographs, may reasonably raise a hope that many persons with artistic talents will become photographers, and that photography may thus be a more real exponent of art-feeling than it has been.

THE TONING OF GELATINO-CHLORO-CITRATE PRINTING-OUT PAPER.

The use of paper coated with a gelatino-citro-chloride emulsion in place of albumenised paper appears to be becoming daily more common. We have noted its advantages from time to time, and now wish to refer to one particular point in connection with its use, namely, that of toning. This has generally been the difficulty with such paper, the alkaline baths commonly in use with albumenised, having proved unsuitable for toning this paper. On the whole, the bath that has given the best results is one containing, in addition to gold, a small quantity of hypo and a considerable quantity of sulpho-cyanide of ammonium. Such a bath tones very rapidly, and gives most pleasing colours. It appears, moreover, to be impossible to overtone the citro-chloro-emulsion paper with it in the sense that it is possible to overtone prints on albumenised paper with the ordinary alkaline bath; that is to say, it is impossible to produce a slatey grey image. The result of prolonged toning is merely an image of an engraving black colour. Of this, however, we shall say more hereafter. We wish first of all to refer to an elaborate series of experiments by Lionel Clark on the effects of various toning baths used with the gelatino-citro-chloride paper.

The results of these experiments we have before us at the time of writing, and we may at once say that, from the manner in which the experiments have been carried out, and in which the results have been tabulated, Lionel Clark's work forms a very useful contribution to our photographic knowledge, and a contribution that will become more and more useful the longer the results of the experiments are kept. A number of small prints have been prepared: of these several—in most cases, three—have been toned by a certain bath, and each print has been torn in two; one half has been treated with bichloride of mercury so as to bleach such portion of the image as is of silver, and finally the prints—the two halves of each being brought close together—have been mounted in groups, each group containing all the prints toned by a certain formula, with full information tabulated.

The only improvement we could suggest in the arrangement is that all the prints should have been from the same negative, or from only three negatives, so that we should have prints from the same negatives in every group, and should the better be able to compare the results of the toning baths. Probably, however, the indifferent light of the present season of the year made it difficult to get a sufficiency of prints from one negative.

The following is a description of the toning baths used, and of the appearance of the prints. We refer, in the mean time, only to those halves that have not been treated with bichloride of mercury.

(1)—Gold chloride (Au Cl_3)	1 grain
Sulphocyanide of potassium	10 grains
Hyposulphite of soda	½ grain
Water	2 ounces

The prints are of a brilliant purple or violet colour.

(2)—Gold chloride	1 grain
Sulphocyanide of potassium	10 grains
Hyposulphite of soda	½ grain
Water	4 ounces

There is only one print which is of a brown colour, and in every way inferior to those toned with the first bath.

(3)—Gold chloride	1 grain
Sulphocyanide of potassium	12 grains
Hyposulphite of soda	½ grain
Water	2 ounces

The prints toned by this bath are, in our opinion, the finest of the whole. The tone is a purple of the most brilliant and pleasing shade.

(4)—Gold chloride	1 grain
Sulphocyanide of potassium	20 grains
Hyposulphite of soda	5 ,,
Water	2 ounces

There is only one print, but it is from the same negative as one of the No. 3 group. It is very inferior to that in No. 3, the colour less pleasant, and the appearance generally as if the details of the lights had been bleached by the large quantity either of hypo or of sulphocyanide of potassium

(5)—Gold chloride	1 grain
Sulphocyanide of potassium	50 grains
Hyposulphite of soda	½ grain
Water	2 ounces

Opposite to this description of formula there are no prints, but the following is written—"These prints were completely destroyed, the sulphocyanide of potassium (probably) dissolving off the gelatine."

(6)—Gold chloride	1 grain
Sulphocyanide of potassium	20 grains
Hypo	5 ,,
Carbonate of soda	10 ,,
Water	2 ounces

This it will be seen is the same as (4), but that the solution is rendered alkaline with carbonate of soda. The result of the alkalinity certainly appears to be good, the colour is more pleasing than that produced by No. 4, and there is less appearance of bleaching. It must be borne in mind in this connection that the paper itself is strongly acid, and that, unless special means be taken to prevent it, the toning bath is sure to be more or less acid.

(7)—Gold chloride	1 grain
Acetate of soda	30 grains
Water	2 ounces

The colour of the prints toned by this bath is not exceedingly pleasing. It is a brown tending to purple, but is not very pure or bright. The results show, however, the possibility of toning the gelatino-chloro-citrate paper with the ordinary acetate bath if it be only made concentrated enough.

(8)—Gold chloride	1 grain
Carbonate of soda	3 grains
Water	2 ounces

Very much the same may be said of the prints toned by this bath as of those toned by No. 7. The colour is not very good, nor is the toning quite even. This last remark applies to No. 7 batch as well as No. 8.

(9)—Gold chloride	1 grain
Phosphate of soda	20 grains
Water	2 ounces

The results of this bath can best be described as purplish in colour. They are decidedly more pleasing than those of 7 or 8, but are not as good as the best by the sulpho-cyanide bath.

(10)—Gold chloride	1 grain
Hyposulphite of soda	½ ounce
Water	2 ounces

The result of this bath is a brilliant brown colour, what might indeed, perhaps, be best described as a red. Two out of the three prints are much too dark, indicating, perhaps, that this toning bath did not have any tendency to reduce the intensity of the image.

The general lesson taught by Clark's experiments is that the sulphocyanide bath gives better results than any other. A certain proportion of the ingredients—namely, that of bath No. 3—gives better results than any other proportions tried, and about as good as any that could be hoped for. Any of the ordinary alkaline toning baths may be used, but they all give results inferior to those got by the sulphocyanide bath; the best of the ordinary baths is, however, the phosphate of soda.

And now a word as to those parts of the prints which have been treated with bichloride of mercury. The thing that strikes us as remarkable in connection with them is, that in them the image has scarcely suffered any reduction of intensity at all. In most cases there has been a disagreeable change of colour; but it is almost entirely confined to the whites and lighter tints, which are turned to a more or less dirty yellow. Even in the case of the prints toned by bath No. 10, where the image is quite red, it has suffered no appreciable reduction of intensity.

This would indicate that an unusually large proportion of the toned image consists of gold, and this idea is confirmed by the fact that to tone a sheet of gelatino-chloro-citrate paper requires several times as much gold as to tone a sheet of albumenised paper. Indeed, we believe that, with the emulsion paper, it is possible to replace the whole of the silver of the image with gold, thereby producing a permanent print. We have already said that the print may be left for any reasonable length of time in the toning bath without the destruction of its appearance, and we cannot but suppose that a very long immersion results in a complete substitution of gold for silver.

BUSINESS MANAGEMENT.

BY "CRITICUS."

Introductory.

Seldom do writers upon photographic topics devote attention to matters appertaining exclusively to the business side of the subject, and doubtless there are many valid reasons which could be offered by the writers themselves, or to the general body of readers, in favour of this method, which to an apparently considerable extent in the minds of many savours of inattention, if not neglect, of the interests of a large and influential class of the community. Such a condition of things when proved would be certain to set many pens going with a view to bring about a remedy; but as these articles are intended to be practical rather than argumentative or hypercritical, we must refrain from pursuing this suggestive point further.

Before proceeding to deal with such a comprehensive subject as "business management" considered in its broad sense would appear to be, it may be advisable at this early stage to briefly explain to those who possess enough interest in the general aspect of commercial photography to cause their attention to be attracted to the above heading, that the materials for that which is to follow have either been gathered from some of the best practical sources, or is the direct outcome of many years' experience. These chapters have been compiled more especially for the purpose of guiding those who are uninitiated in pursuing the practice of photography for profit, and to assist others whose experience is of a somewhat limited character.

The question which arises at the close of every boy's educational training is of paramount importance as affecting in all probability the whole of his future life. What occupation is most suited to his especial form of mental and physical development or abilities, and in which direction does his taste lie? There are many circumstances to take into consideration, from the character of the education which he has received down to the latest evidence of aptitude for any particular study or hobby. Perhaps the most difficult case is that in which the intellectual faculties are much further in advance in growth than the physical, because so few remunerative pursuits are successfully carried out without considerable labour. The practice of medicine entails a heavy tax upon the bodily powers, while the preparatory study, if conscientiously performed, is more exhaustive in its character than that for any other profession. Many whose means are insufficient to enable them to go through the necessary curriculum for this or any other of the more remunerative employments, are obliged to bring their intelligence to bear upon some pursuit, less dignified, perhaps, but capable, under fairly auspicious circumstances, of providing them with an income. Such a pursuit is to be found in the practice of photography. So it has often happened that those with brighter prospects at the outset would have taken honours in one or other of the higher professions, have found a field for their knowledge, culture, and artistic taste in the business of producing presentments of their fellows by the aid of light. Such have always added much to the general knowledge upon the subject in hand, and have not hesitated to diffuse the same for the good of all employed in this class of work.

Bearing the foregoing in view, it would be strange if improvements did not succeed each other with great rapidity; indeed, the progress already made can be traced, in a large measure, to the influence of men of more than average intelligence and mental cultivation not directly connected with the art in a commercial sense. It is also true that the construction of appliances and apparatus of every description has reduced the scientific part to great simplicity; but, nevertheless, really passable photographs can only be turned out by those who have made themselves somewhat acquainted with the first principles of the process, which involves the possession of a little exceptional ability. Sufficient rudimentary instruction to this end is now given in many of our large schools, as evidenced by the number of busy cameras at work, during vacations, in the hands of the young hopefuls.

It is not easy to trace the real course by which such beginners have been landed in regular studios with all the necessary surroundings. In some cases, no doubt, a natural love of scientific pursuit, coupled with an attachment to some branch of art, has been the motive power. In other cases the idea that money could be made without very arduous labour, through the medium of a rather interesting occupation; and so combining amusement with profit has induced them to go in for the title of professional. At any rate, it is a well-known fact that, with few exceptions, professional photographers have had their first experiences as amateurs.

However, it matters little what are the ulterior considerations which lead men to embark in a business (already over stocked, if the general opinionmay be accepted); our duty is to show in what way their purpose is best carried out; in short, to point out the chief conditions of success in connection with the business of photography.

It will have been noticed that the words business and profession have been used in the general sense as convertible terms, but we would not be understood to imply that we make no distinction. On the other hand, we have no wish to fight over again the old conflict on the subject. We merely record our opinion that an occupation which, to do it justice, involves a more than ordinary amount of knowledge in various branches of science, art, and mechanics, coupled with a fairly all-round education, and a manner and address that savour somewhat of refinement and culture, is one as worthy of the title of profession as nine out of ten to which that name is attached. In the practice of medicine we find men who elevate themselves to the position of specialists by virtue of their own talent and a prolonged study of a particular branch. So in photography, we have men whose exceptional abilities have placed them in the front rank among their fellow workers, and by perceptible degrees it is easy to trace a gradual descent from a social point of view in both professions until one is forced to stop at the bottom of the class ladder among quacks and hucksters. Here we find the itinerant vendor of pills and ointment, and the roadside manufacturer of your portrait "while you wait," both engaged in an honest attempt to procure a livelihood, which in many cases is more than can be said of their better-off brethren, who are in a position to dictate terms to those who patronize them. Whatever may be the esteem in which the itinerants hold the memory of their richer confrères, they have the satisfaction of knowing that as far as they are concerned a fixed base of equality in the professional world has been reached in science and art. Other of the more remunerative callings, and probably all business carried on for actual trade, offer instances less marked, perhaps, than the one we have selected.

Our purpose in the following paper will be to indicate the lines of action most likely to lead the thoroughly informed and earnest workers to the attainment of what might be called commercial prosperity, the presumption being that the necessary knowledge and practice have been acquired, and that adequate means are likewise available; for unless these conditions can be complied with there is considerable risk attending the embarkation, not only financially, but in the evil effects wrought upon the mind by excessive anxiety and misspent energy.

NOTES ON THE ART GALLERIES

BY WIDE ANGLE.

The Winter Exhibition of the Royal Academy should not be overlooked by the portrait photographer. The portraits both of the British and foreign schools, not only form the bulk of the collection, but are certainly the most interesting portion of it. The means at the disposal of the old landscape painters were limited. Nature baffled them; they were shakey in regard to perspective; laborious imitation, successful enough if a piece of satin or a lace collar had to be painted, altogether failed when applied to the evanescent aspects of a landscape. They consequently created a conventional mode of treatment both of form and colour, interesting enough in its place in historical art, but from which little can now be learnt practically.

With portraiture the conditions are altogether different. The rules which govern the composition of a well-balanced portrait were early comprehended, and have not altered at the present day. The power of representing flesh was thoroughly mastered, and fidelity of expression rigidly preserved. One feels this instinctively on looking at a Rembrandt or a Velasquez. These men were uncompromising in their treatment of the human face, and any photographer who has been fascinated by the "fatal facility" of retouching cannot do better than take a wholesome tonic in the shape of a study of portraits of the old school.

From the examples of the English portrait school of the eighteenth century, which was governed by fashion, much is to be learned and remembered—in order to avoid. Take, for instance, Harlow's portrait of Sir William Beechey, R.A. (No. 9). Sir William, wrapped in a fur-trimmed robe, is sitting in an armchair, has a placid smug simper of contentment in his features, his hair is artistically dishevelled, and his head is resting affectedly on his hand. In the background, almost as prominent as the figure itself, is a portion of Beechey's picture of George III. and the Prince of Wales reviewing the 10th Light Dragoons. The whole effect is stilted and artificial.

Sir Joshua is even worse in his portrait of Mrs. Lloyd (No. 37), but as the President is usually so judicious in his treatment, one cannot help thinking he must have yielded to the fancies of the lady. She is painted in the conventional costume of a Phyllis or Rosalind, she wears sandals, and is placed in the midst of a wood, leaning against a pedestal (a thing so likely to be found in a wood !) carving her name on a tree. Fashion, of course, is answerable for this absurdity, as it was also answerable for curtains descending from the clouds or hanging from nothing at all, and the inevitable pedestal and parapet. Romney's portrait of "Isabella, Countess of Glencairn" (No. 153), the same artist's "Mrs. Townley Ward" (No. 145), and Gainsborough's "Countess of Buckinghamshire" (No. 148), are forcible examples of the school which bequeathed to photographers the plague of conventional "properties," from which they are only just emancipating themselves. Apart from this stereotyped fault, Romney's portrait of the Countess of Glencairn is a most delightful picture. The pose is charmingly natural in every respect save one, the uplifting of the left foot, which savours slightly of affectation. The expression is of that sweetness of which Romney alone had the secret of producing, and the complexion, it is unnecessary to say, is of the hue of health. All Romney's sitters are ruddy in the face, whereas those of his great rival, Sir Joshua, are frequently of a waxy yellow. This we know is due to the fugitive colours which Reynolds used. No doubt, when first painted, his flesh tints were as brilliant as Romney's. Romney shows to great advantage in his portraits of the two children of Lord Thurlow (No. 11). One is playing a harpsichord, and looking at the spectator, while the other is leaning on the instrument. You forgive the bad drawing of the leaning arm and the faulty perspective of the instrument, for the sake of the purity of the colouring and the fresh innocence of the faces. In a portrait of Mrs. Horsley (No. 18) he is equally successful, though one is tempted to think, from the repetition of expression and complexion, that Romney had a "manner" into unison with which he brought his sitters. It is to be feared he flattered considerably.

Reynolds is well represented so far as numbers are concerned, but in several the flesh tints have faded terribly. To my taste his best portrait is that of Elizabeth, Countess of Pembroke (No. 26), one of the most beautiful women of her time, and of whom Walpole spoke as "the picture of majestic modesty." There is not an atom of Romney's manner here, yet the expression is sweetness itself.

Gainsborough is not seen at his best. Dorothea Lady Eden (No. 34) is not a prepossessing model, and her thin lips do not encourage one to believe she was of a very amiable disposition. But is it possible she could have had such attenuated fingers as the painter has given her? It may be heresy to say so, but I cannot help thinking that Gainsborough was often faulty in his drawing of the extremities. Take the portrait of his daughter (No. 46), for instance. Miss Gainsborough is a thin-visaged, slenderly-built girl, but her hand is extraordinarily large and clumsy. On the other hand, the arms of Anne, Countess of Chesterfield (No. 146), are, without any drawing worth speaking of, and are absurdly bony and stick-like in appearance.

Two most interesting portraits are Hogarth's "Peg Woffington" (No. 25), and the same painter's "Miss Ray" (No. 31), who was murdered by the clergyman Hackman. Mrs. Woffington has a lively mobile face, full of piquancy; but it is difficult to discern Miss Ray's claim to the beauty which she is said to have possessed. The features are a little heavy, and appertain to the Dutch type.

Other instructive examples of the British School of Figure Painters are to be found in pictures by Bartolozzi, W. Dobson, Zoffany, Wilkie, and last, but not least, in the four historical pictures of Wilkie, C. R. Leslie, Hayter, and Sir Martin Archer Shea. The first three represent respectively the first council held by the Queen, the Queen receiving the sacrament after the coronation, the christening of the Prince of Wales, and the fourth a portrait of the Queen in her robes. Apart from the interest they possess as preserving the features of personages of various degrees of celebrity, these pictures may be pronounced as entirely worthless. It is difficult to say who has approached the nearest to utter badness. I think the victory must be divided between Leslie and Hayter. One point, however, is worthy of notice: all the four painters differ in their notions as to what the Queen is like, quite as much as the photographers of the present day. Sir David Wilkie represents her hair of a sandy yellow; five years later, according to Leslie, it has lost its yellowness, and is simply a dark sandy; but, notwithstanding, Sir Martin Shea, in the same year, discovered that it was of a deep brown; while it became several shades lighter when painted by Sir George Hayter seven years afterwards. The difficulty of obtaining a correct likeness of Her Majesty appears to have been as great in her youth as it is in her old age.

Turning to the foreign schools, the four magnificent portraits by Velasquez at once stand out as the most important contributions to the collection. These four are Francisco Gomez de Queredo (No. 111), Phillip IV. of Spain (No. 126), Don Gaspar de Guzman (No. 135), and Pope Innocent X. (No. 160), all distinctly differing from each other, and all masterly examples of portraiture. It is impossible to admire too much the firm handling, the admirable posing, and the skilful treatment of lighting. No photographer can fail to derive advantage from a study of these fine works. Other notable pictures will be found in Murillo's portraits of two fair Galicians (No. 114), Lorenzo Lotto's portrait of a woman (No. 124), Titian's portrait of Catrina Cornaro, Queen of Cyprus (No. 129), the same painter's portrait of a Duchess Sforza (No. 132), Murillo's own portrait, painted by himself, and in several portraits by Van Dyck.

For the rest, the collection includes many examples of the Dutch and Flemish schools, Rubens, Cuyp, Rembrandt, Nelscher, Vander Velde, Wouvermann, Van Ostade, Teniers, Both, Hals, and others. Greuze is represented by two extremely interesting portraits of himself and of his mother, and by a picture of a girl with a dove. The two first are of a much loftier standard than Greuze usually reached, and had not fashion compelled him to devote himself to the painting of lovely but alluring female faces, he would possibly have obtained high rank among portraitists.

Most of the examples of the Italian masters are Holy Families, innumerable versions of the Virgin and Child, and kindred subjects, interesting historically, but apt to be wearisome. But if the visitor pass these over he will have an ample shillingsworth in the pictures I have named, and in the two rooms devoted to Turner's water-colour drawings, for the bare mention of which I have only space enough.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter I.—Introductory—Explanation of Terms—Concerning Beginners—Applications of Photography—History of Photography.

Photographs are spread abroad in such abundance, that it is not easy to imagine any person living in what we understand as a civilized country who has never seen a picture produced by light. There are, however, many individuals whose ideas of a photograph are summed up in what we know as a silver print or a collodion positive; and those who have a definite notion of the manner in which these are produced are few and far between. A great majority even of those who practise photography as a means of livelihood know nothing of the changes they bring about except that, as a rule, they result in something saleable.

A photographer must work intelligently if he is to work thoroughly and well; he must, in short, work scientifically. Although the artistic aspect of photography has very necessarily been prominently brought forward, it is never suggested that art study alone will make a photographer. A knowledge of art indicates what is desirable in a picture, but it is an acquaintance with the science of photography that tells us how we may realize our ideas.

The object of these lectures is not to discuss the last modification of positive printing, or the latest suggestions for developing; such matter as these will not be neglected, but we shall have chiefly to do with the fundamental principles out of which the practical formulæ of the past and the present have grown, and to which we must still look for further improvements.

The term photography is rightly applied to any process for reproducing writings, drawings, pictures, or designs of any sort in which light takes an active part; and it is correct to call such a reproduction a photograph, although the proof has been produced by a lithographer or in an ordinary printing press. It is not customary to apply the term "photographer" to everyone who takes part in the production of photographs, nor is this title earned by the purchase of a camera. The engraver is not only the owner, but the successful user of his tools, and must have had a varied experience of the processes of his vocation; and in calling him an engraver, we distinguish him from those who only assist him. It is convenient, as far as possible, to use the word photographer in a similar way.

Photographs cannot be taken in the dark, yet every photographer uses a dark room, a dark box, and, at times, special devices to keep out the light. Light is the power of the photographer, and he must have it perfectly under control. Light alone, however, is not always of practical utility. It cannot etch a gelatine plate, but it produces changes that guide the etching liquid, and although it cannot make a negative, it gives us the possibility of developing one. In every case, perhaps, the action of light is supplemented by a chemical reagent.

Our preliminary studies, therefore, naturally divide themselves into the study of light, its properties, and the ways in which it can be made servicable; and the study of chemistry so far as this science lends itself to the photographer.

But there are a few matters that must first claim our attention. Beginners should begin at once, even in these short wintry days, and their first attempts at negative making should be on a black and white flat subject, such as an impression from a large woodcut. The coarser or thicker the black lines or patches, the better will it answer the purpose. He should expose plate after plate in the camera, after focussing such an object as sharp as he possibly can, until he finds he can develop a negative with its transparent parts quite or nearly free from any deposit of silver, and its dark parts very decidedly dark when held up close in front of a good gas or lamp flame. Many faults will show themselves in this simple exercise that will not need an expert to detect, and these must be resolutely fought against until a certain degree of manipulative power is gained. After this a good bright-looking photograph may be set up to experiment upon, to get practice in the reproduction of different depths of shade. Then a simple object out of doors, from twelve to twenty feet away from the camera, may advantageously be photographed before going further a-field.

About twenty-five years ago, a photographic journal, in referring to an invention that has long since been superseded, said that "the process of taking views was reduced to a mere mechanical operation, and the complicated art of photography brought down to the meanest capacity. An hour's instruction from an adept would be sufficient to convert the timid amateur into the accomplished artist." It would be a sorry time for photography if this state of things were ever to come to pass, and it is quite certain at present that nothing but patient and persevering practice will give the skill of an ordinary operator, the "accomplished artist" resulting only where natural talent is present with this practice.

The applications of photography are so numerous, that we can do little more than catalogue the chief of them.

The painter has his "studies," and often photographs instead of sketching. The sculptor and the architect find that photographs are not only cheaper, but more reliable than other representations. It would be difficult to find an estate agent who never showed a photograph in furtherence of his client's interests. The wood engraver is not dependant upon the draughtsman, for the block is drawn upon by the agency of light; and the engraver himself often finds his work done both cheaper and better by some one of the many photo-mechanical processes.

The military engineer photographs foreign forstications, and finds the camera more rapid and reliable than the draughtsmnan in recording the results of artillery experiments. The pigeon post, which was so useful during the siege of Paris, was made possible by photographic means, and it is stated that as this method of conveying despatches has proved itself indispensable in certain emergencies, the Germans have established a regular service of pigeons in the chief fortresses of the empire.

Civil engineers generally have photographic establishments in connection with their workshops; and the previously laborious task of reducing maps from one scale to another is now more quickly and exactly done by photography.

The scientific man in general prefers photographic records as being unbiassed and permanent. A ray of light is caused to draw its own curve to represent the movements of thermometers, barometers, magnets, &c. The astronomer, indeed, is finding that photography can detect what is not visible to the eye, because the photographic effect is cumulative.

By means of photographs, foreign lands are made familiar to us, and those of our photographs that are permanent will certainly become valuable as records of manners and customs when a few generations have passed away. Priceless unique documents might be copied by the camera, and as the reproductions would serve the purposes of classical research, the originals would suffer less injury, and if they were destroyed they would not be lost to us.

Some problems in natural history, such as the methods of the movements of animals, can be solved only by photographic means. And if we had a mind to do so, we might continue to multiply instances of the applications of photographic processes, for we have not mentioned their uses to the police detective, in ordinary portraiture, in picture making, and in other matters that are more or less familiar.

We may well ask how has our art been developed, when we see that it has grown to be indispensable in so many ways. A brief indication of the principal steps that have led up to its present condition is all that we have time for now. It is believed that only authentic sources have been consulted in compiling the following table, but it is possible that some of the earlier dates, especially those before A.D. 1800, are only approximately correct.

1556. The alchemists observed that chloride of silver darkens when exposed to light.

1590. Porta invented the camera.

1727. J. H. Schulze got copies of writing in sunshine by means of nitrate of silver solution mixed with chalk.

1737. Hellot used nitrate of silver and chloride of gold solutions on paper.

1757. J. B. Beccarius used chloride of silver

1770. Scheele showed that violet light was the most active in darkening chloride of silver.

1774. Scheele isolated chlorine.

1777. He found that chloride of silver lost chlorine when it was exposed to the light in water.

1796. Brougham suggested the possibility of getting a picture on ivory moistened with nitrate of silver, and exposed in a camera.

1801. Ritter found that chloride of silver was darkened by the ultra-violet of the spectrum.

1802. A paper by Thomas Wedgwood (son of the great Wedgwood) and Humphrey Davy was read at the Royal Institution on copying paintings done on glass, and making profiles by means of nitrate of silver. Davy found that chloride of silver was better than the nitrate, and that leather was better than paper. Some photographic prints were got by means of the solar microscope, but these experimenters failed to find a fixing re-agent.

1810. Seebeck observed that when the solar spectrum was projected upon moist chloride of silver paper, some approximation to the natural colours was produced.

1812. Courtois discovered iodine.

1813 or 1814. Joseph Nicéphore de Niépce used metal plates coated with a film of bitumen, exposed them in the camera for some hours, and dissolved away the still soluble unexposed parts of the film with oil of lavender. It appears that by 1826 he had so far perfected this process of heliography as to have etched his developed plates, and to have got prints from them after the manner of copper-plate printing.

1819. John Herschel described the hyposulphites and the solvent power of the alkaline hyposulphites upon chloride of silver.

1824. Daguerre began experiments on much the same lines as Niépce, hoping to make permanent the pictures produced by the camera.

1826. Balard discovered bromine.

1827. Niépce was refused a hearing at the Royal Society because he declined to explain his process.

1829. Niépce and Daguerre entered into partnership.

1833. Niépce died. Daguerre continued the work, and from using iodine to stain the surface of his silver plates was led ultimately to the invention of the Daguerreotype process.

——* Fox Talbot is stated to have begun his researches.

1835. Fox Talbot stated in 1839 that several pictures of a country house which he then showed had been taken in the camera in 1835.

1838. Daguerre explained his process, the Daguerreotype, to Humboldt, Biot, and Arago. Through Arago's influence Daguerre had a pension of 6,000 francs per annum, on condition that he surrendered his rights in his process.

1839. August 14th. The Daguerreotype process was patented in England.

—— August 19th. The Daguerreotype process was publicly explained in Paris, and given free to the world (except England).

—— Fox Talbot described his process of "photogenic drawing," in which he used paper impregnated with common salt, and sensitised with nitrate of silver, and fixed the image with a saturated solution of common salt. He produced both negatives and positives. He also substituted bromide of potassium for common salt to get the sensitive surface.

—— John Herschel recommended hyposulphites for fixing. He exhibited photographs made by himself at the Royal Society, one of which was a picture of his telescope, and taken in a camera.

—— J. B. Reade used an infusion of nut-galls (whence we get gallic and pyrogallic acids) to render nitrate of silver on paper more sensitive to light, and he fixed with hyposulphite of soda.

—— Mungo Ponton pointed out that paper soaked in a solution of bichromate of potash and dried was changed by exposure to light, and that the chromium compound produced by light could not be washed away.

(*To be continued.*)

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YELLOW NEGATIVES.

After the introduction of gelatine negatives, the old wet plate photographer had rather an uncomfortable time, until he became accustomed to what he was wont to call the "sickly colour" of the products of the new departure, and to the present day there are many old workers who still object to it, and try all in their power to obtain images as much like the rich, purplish olive, that characterized a good wet plate negative, as modern photography will allow. Naturally, those who have never experienced the joy of coating a plate with collodion, and, after dipping it into the silver bath and finding a perfect creamy coating, producing a beautiful negative of whose capabilities and excellence a second thought was not needed, experience no regrets, and have none of those yearnings after the past that the older hands still feel. But the question naturally presents itself: Is there, or is there not, any disadvantage in this much decried tone; and granting there be, how is it possible to obviate its production?"

Without obtruding too forcibly the views we hold upon the question, we yet would answer in the affirmative to the first portion of the query, and we will describe a mode of working that will meet the second. Let us at the outset meet one objection, which, with some show of logic, may be urged at once by those who favour the yellow tint. Negatives in plenty are to be found, they will say, and truly, which, if the yellow tint were removed, would in consequence give far worse prints; ergo, they will argue, that tone must be an advantage. In reply, however, we would urge that there are also negatives—dry or wet plate matters not—that are covered with tissue, blue painted in their shadows, and which need to be printed in the shade for good prints to be secured; and by the same argument all negatives would require tissue paper, blue paint, and shade printing, if the best results were to be secured. This being clearly absurd, the argument falls to the ground, except as regards a possible advantage from the yellowness as an adventitious aid, and the case must be taken on its merits.

Let us first point out that the colour of the medium through which the light passes to the print greatly affects the resulting colour, even before it is placed in the toning solution, as all practical printers are aware. The reason has been clearly pointed out by Captain Abney as being due to the preferential sensitiveness of chloride or albuminate of silver to the different rays of the spectrum. From the facts, the conclusion must be deduced that the specific action of a yellow tint, when advantageous, may be imitated by an extemporized stain which will produce a great blueness of tone in the print; while if the old purplish tone prevail, it will be found to possess a more neutral character as regards the colour of the print as it leaves the frame.

So far as regards the influence of the colour of the negative upon the tone of the print—using the word "tone" in its accepted photographic sense—the most important point to consider is the effect upon the quality of the image: is the colour neutral in that respect, or does its influence act for good or for evil? Speaking as we do, *ex cathedra*, in a sense, we deliberately express our opinion that it is, on the whole, for evil. Let it be remembered in the print case that the comparative depth of this yellow tint is not a positive quantity; some negatives have it to a slight degree only, while others appear simply as though they had had a violent attack of jaundice. This greater or less depth of the colour is in no way dependent upon any special characteristics of the negative itself, but is governed simply by the condition of the developing bath, and the time the plate has been exposed to its influence. Hence, if the colour have an effect of good, or of evil, an element of irregularity is introduced, and the extent of this maleficent or beneficent action is governed almost by chance. Seeing that we always advocate certainty and uniformity, as far as may be, in photographic operations, this is a grave fault, most undoubtedly. Further, we contend that when this questionable colour is present, the very serious evil is introduced of uncertainty in the power of judging with minuteness of the real capabilities of the negative for printing purposes, either as regards delicacy of tones, or brilliancy in the resulting print. What photographer is there who at one time or another has not been woefully deceived in the printing power of a gelatine negative which he had proudly imagined to be perfect? One time it has printed flat, and devoid of variety of shade of contrast; at another it has declined to give a print that any amount of attention and care would tone up richly; while a third, which to him appeared all that was delicate and rich, takes an almost unlimited time to print, and, when toned, possesses neither range of tone nor breadth of effect.

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* The short lines put to begin the several new paragraphs are to indicate that the year written above is again referred to.

This was not so in wet plate days; the artist, when he obtained a negative, could tell at a glance whether it was under, over, or correctly exposed. If either of the two first, he was aware there was uncertainty as to getting good prints; but he knew exactly the class of result likely to be obtained; while when he found, as he was able to do unerringly, that he had correctly estimated the timing, he knew, with the greatest certainty, the kind of print he would get from the negative—the range of shades, the colour it would print to, and the degree of delicacy, breadth, and richness it would exhibit when dried mounted and finished. This, we assert, is never attained by the expert in dry plate work, though continued practice will reduce the degree of uncertainty to a minimum, and herein we think we sustain a grave count against the continuance of the stain.

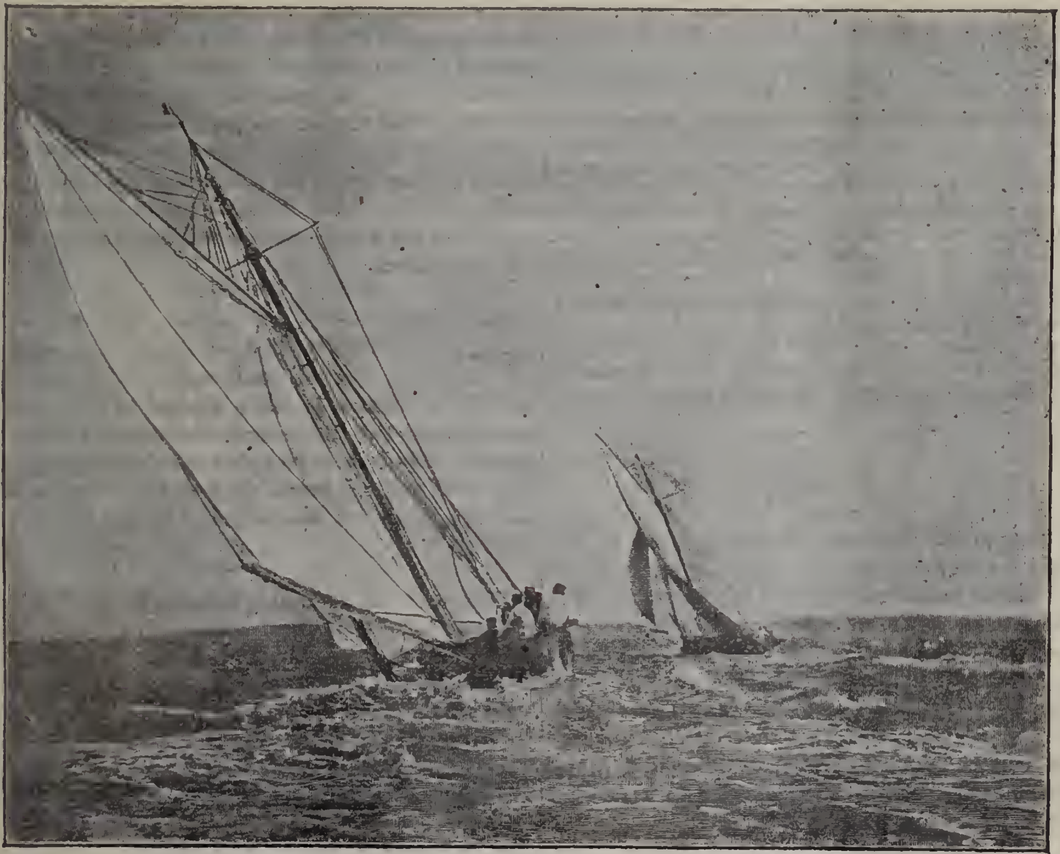
We use the word stain deliberately, for it can be readily shown that the yellowing is a stain, and nothing but a stain. Years ago, Mr. Watmough Webster showed how an exceedingly yellow dry plate negative could be brought to a colour closely resembling that of a wet plate, and prolonged action does not further influence the colour. In other words, the yellow is dissolved out, and the actual true image left in its purity. We may say, in addition, that we have seen negatives so treated which gave prints infinitely superior to those obtained before the removal ef the colour, a state of affairs that may be looked upon as quite a set off against the first supposition we raised in the commencement of this article.

We believe we have logically shown the disadvantage and the inadvisability of the continued retention of this yellow tone in gelatine negatives, and our task now is to show how to prevent it and how to cure it when present. This will afford matter enough for a complete article; hence, rather than trespass further upon our reader's attention to this one topic, we will shortly revert to it in this its final aspect.—*Photographic Times.*

PHOTOGRAPHING FROM A SAILING BOAT.

BY A. J. WEST.

Many adventures and escapes I have experienced while photographing from my sailing boat during the last four years, but in no case have I been so near drowning as on the day I was taking the yachts, one of which forms the engraving in this week's News. The picture itself does not look particularly exciting, but one can easily tell, by the topmast being housed, the foam, and the list the vessel has, that there must have been a strong breeze blowing, which means excitement both in racing and photographing.



I had my boat under a three-reefed mainsail, reefed foresail and mizen, and we had frequently to shake her up in the wind to prevent her filling. We however kept on, making for Stokes Bay, where the regatta was being held. A strong east tide was running, and the wind westerly. Although it was very rough, my man said, as soon as the tide turned, the sea would rise considerably, and round Gillkicker Point it would be something lumpy. I had twelve shots at the different yachts racing before one o'clock, and having expended all the plates in my slides I proceeded to change. Now changing plates in a small cabin, with the boat dodging every wave, is not an easy matter. I have to sit on the floor, the plate box jammed between my leg and the mast, the slide on knee. Now and again the boat gave an extra lurch, and my back would come in hard contact with boat's side, then the bow would make a sudden downward motion, hitting the water with a sound as if the planks must give way. This idea occurred to me whilst I was in the midst of changing the plates, and a cold chill went through me, as I should have been drowned like a rat in a trap, as the door of the cabin fits so tight when the boat heels over that it can only be opened from the outside. I hurried over the changing, and felt glad when I had finished and was outside.

About two o'clock the small boats started, and it was from them I anticipated getting some good pictures. The west tide was beginning to make, and the sea had risen considerably. I sailed about in the course the yachts were to come about half a mile from the starting vessels close to Gillkicker Point; the wind came in gusts, and I felt as if the boat must turn over. We had to keep baling her out. The preparatory gun had fired, and three small yachts could be seen on the line. Immediately the starting gun went off, so did they. It was a pretty sight to see them cutting up the foam and throwing up the spray on all sides, the bowsprits now in the waves, and now pointing upwards. I saw the best view would be across their stern, and gave directions to my man to go as close as possible. They were not long in ploughing their way to us, and when within one hundred yards a squall came on which made my boat heel over so much that I thought it was a case of upsetting. "Slack off the fore-sheet," shouted my man, "while I keep her hard away for the yachts." I did so, and then took my station by the camera.

"Now look out, sir; I am going to put you on board the yachts." We flew along into the wake of the yachts, the water rushing into the boat from the lee side, when, just as I sighted and fired, a big sea came and hit the weather bow and broke right over the boat, entirely swamping us.

"We must run for it," said my man; "it'll be worse presently; the west tide hasn't commenced to run its hardest yet." I quite agreed with him, for I was anxious to get back home and change my wet clothes, and glad to think I escaped being washed overboard. The water was up to the deck boards, and my man started baling, while I wiped the wet off my camera, &c., and packed them away.

We soon got into harbour, and I was thankful when I had dry clothes on, and sitting down to tea and relating the adventures of the day to the family circle.

Notes.

According to the *Academy*, we are promised in *The Year's Art* for 1887 an article upon Art Copyright which will deal shortly but completely with the question. It is satisfactory to know this. The Bills on the subject which have been introduced into Parliament have utterly failed to settle anything. Perhaps when artists, photographers, engravers, and print-dealers have come to an agreement as to what they all want, and what they all object to, the question will be decided. While awaiting that happy time it will be instructive and interesting to hear what *The Year's Art* has to say.

A letter from the Secretary of the Camera Club, which will be found on page 15, gives some particulars of the first annual conference or convention which this active body has organised.

As the conference is to be held in London (Feb. 8th) and in the convenient theatre of the Society of Arts, one may hope for a large and representative attendance.

A correspondent of the *Photographic Times* has discovered that the time occupied in pronouncing the words one, two, three, four, just fast enough to articulate each word distinctly, and not run them together, is exactly equal to one second. He therefore suggests that, to secure uniformity in exposing, this plan should be adopted in place of the old method of counting what are supposed to be seconds, but which may vary according to the individual. There is undoubtedly something in this notion, as persons' ideas of time certainly differ, and it is not always convenient to use a watch, to say nothing of the disagreeable fixed expression which the conciousness of being timed sometimes produces on the sitter. But in counting one, two, three, four, several times over, as would be the case in the studio, there is a risk of counting a second too much, or too little. A hint, therefore, might be taken from the musician who, when he has so many bars rest, counts thus:—*one*, two, three, four; *two*, two, three, four; *three*, two, three, four, and so on. In this way the probability of a mistake is entirely obviated.

It would seem that the London cabmen have taken our recent hint, and circulated among themselves copies of the portrait of Mrs. Giacometti Prodgers, for this lady now instances the case of a cabman who called out at the top of his voice, "Old Mother Prodgers," as an example of the sort of treatment she is constantly subjected to. In taking steps to invoke the penalties of the Law upon one of the offenders, Mrs. Prodgers was unfortunate, as she summoned the wrong cabman, and had to compensate him for loss of time.

Quite apart from the undoubtedly large sale which a telling portrait of Mrs. Prodgers should have among cabmen of various countries, most students of physiognomy—and who is not more or less a student in this subject?—would like to have the portrait of a woman whose sense of personal dignity is so keen that in order to avenge such a very small personal insult, she would like to see a cabman not only fined, but also subjected to the loss of a day's earnings.

In one of the German photographic publications we notice an advertisement of a magnesium lamp manufactured by O. Ney, and it is stated to be smokeless, and also to burn steadily for three hours. If this is true, the new lamp should prove very valuable to those making enlargements and to lanternists; but how is the smoke got rid of? There is a drawing issued with the advertisement, but it gives no clue to the essentials of the construction, and as we have not seen the apparatus we can give no information. The Photographic Society of Great Britain is now looking for some substitute for the lime light, as the use of this is forbidden in the Gallery, on account of a difficulty with the Insurance Company. A really good and steady magnesium lamp should be welcome in this quarter.

The Committee who have the proposed Jubilee Institute in hand will not have an easy task before them. Although they have made a few inquiries as to the price of land in or about the centre of London, it is pretty evident that the selection of a South Kensington site was a foregone conclusion. We may be wrong, but we fancy that the days of enthusiasm for South Kensington are passed, and although a number of rich men may put down their money to assist in the project, anything like a national subscription is vain to hope for. Every provincial town will be striving to raise funds for its own Jubilee celebration, and will not have much to spare for the Institute. As for the metropolis, the feeling is so universal against the chosen position, that the middle classes of the centre, the northern, the southern, and the eastern portions, even supposing there is a revival of trade, will not put their hands in their pockets very deeply. It is also, we believe, a mistake to suppose that the wealthy residents of Cromwell Road and its vicinity will enter very warmly into the scheme. They have had enough of South Kensington-eries, and are heartily tired of the crowds, the noise, and the racket of the last four years. What is needed to make the Institute a success is for the Queen herself to set the example. Suppose she were to put down a million—she could well spare it from her accumulated wealth—and purchase the Christ's Hospital site. This would at once stimulate enthusiasm, and the undertaking would go like wildfire. So far as has yet been announced, it does not appear what Her Majesty is going to contribute towards the expenses of her own Jubilee. She could not do better than adopt our suggestion.

Apropos, would she not earn the gratitude of her subjects if she were to expressly forbid the erection of any more statues? If they were all alike one would not so much mind, but when every sculptor has his own notion as to how Her Majesty should look, the result is rather chaotic. Just imagine what confusion posterity will be in to determine what the Queen really was like!

The fact that commercial iodide of potassium is far purer than in the days when photography was in its infancy was commented upon by us some weeks ago; the gain to society from this circumstance being doubtless greater from a therapeutic than from a photographic point of view. But of what avail is this if druggists, in makng up prescriptions, put in less than was ordered? may well be asked by those who read in Tuesday's *Standard* of the circumstance that a London druggist was fined for having made up a prescription with less iodide of potassium than was prescribed. One naturally enquires whether the Pharmaceutical Society has not the power of withdrawing the licence of any druggist who really shows himself to be fraudulent, but it appears to us that the druggist in question was summarily convicted on very insufficient evidence.

A photograph is not always convincing evidence of identification. A man tried this week at the Middlesex Session strenuously protested he had not been previously convicted, and although the photograph alleged to have been taken during his last term of imprisonment was put in, he yet denied the accusation, and made so much impression on the jury that they might have given him the benefit of the doubt had not the certificate of the previous conviction mentioned certain marks on the body. The prisoner was removed and examined, when it was found that he had corresponding marks, and the jury of course discovered that the photograph was "extremely like." But it is clear that it will not do to trust alone to a photograph.

A difference of opinion exists between Isaac Roberts, a well-known astronomer, and the *Journal of the Liverpool Astronomical Society*. At the annual soirée of the associated societies of Liverpool, Mr. Roberts exhibited a photograph of a portion of the Orion nebula in which twenty of the stars were represented by lines. The lines, Mr. Roberts considers, are not stars at all, but planetoids, and that the lines represent their proper motion during sixty-seven minutes' exposure. The Society's Journal, on the other hand, taking an extremely prosaic view of the matter, holds that the lines are simply stars run together caused by the plate slipping.

The war of prices which broke out some time ago among the photographers of Chicago is being carried on with increased vigour. High-priced photographers who have hitherto held aloof have been drawn into the contest, and one of the leading men has reduced his charges for cabinets to three dollars the dozen. The Sunday papers are full of photographers' advertisements with flaring titles, and the climax was reached when, a short time ago, a "West side dealer"—whatever this may be—came out in the *Chicago Tribune* with a three column displayed advertisement, offering to duplicate the prices of any other photographer. If this kind of thing continues, the belligerents must be prepared for the fate of the Kilkenny cats, unless, indeed, the Chicago people be stimulated by the photographers to renew their interest in photography. But it is hopeless to expect a second carte mania.

An American paper tells a "queer story" of an action brought by a photographer against the late Khedive, for whom he executed a good deal of work, but could not get the money. The case was decided in Paris a short time ago, and the photographer, gaining the day, obtained an execution on his ex-majesty's goods. Accordingly, armed with this formidable legal document, the daring photographer proceeded to the Khedive's residence, and, having gained admission, made a raid upon the dress trunks of the ladies of the harem. Immediately a tremendous uproar arose, the fair bul-buls rushing to save their property. In the excitement of the moment, the ladies quite forgot they were unveiled, and had exposed their loveliness to the profane gaze of the giaour. The photographer happened to be a man of readiness and resource, and, in a loud voice, announced that if the ladies would not quietly allow him to assert his legal rights, he would photograph them on the spot! The threat was sufficient. Helter-skelter went the whole posse out of the apartment, and left the clever knight of the camera in undisputed possession.

The proprietor of a restaurant in South London has made an artful use of photography. His house happens to be of a peculiar shape, and runs diagonally from one main thoroughfare to another, with a door at either end. The bar occupies the whole length of the ground floor, which is wider at one end than at the other. What the ingenious proprietor has done is to have a series of photographs taken. One represents the wider end of the bar, where there are a couple of small dining tables, and this he calls the dining room. The photograph of centre of the apartment, looking from the bar on to the fire-place, he terms the grill room. A photograph the reverse of this is dubbed the buffet, while the fourth, representing the small end of the bar, is styled the smoking room. By a judicious use of a wide angle objective, the photographer has made these several sections take the appearance of spacious apartments, and only by very careful examination can it be discovered that they are all parts of the same room. As an advertisement it is a good idea, but rather disappointing when the reality is discovered. And yet we are told that photography cannot deceive !

It was a happy idea of Professor Dewar, in his lectures on photography at the Royal Institution, to go through the actual experiments made by Wedgewood, Niepce, and Daguerre. His juvenile audience by this means obtained a much more vivid impression of the history of photography than they could have secured by any amount of explanation. On Tuesday, the Professor gave a practical illustration of the first essays of Wedgewood, immersing a piece of white leather in nitrate of silver, and exposing it in the electric beam under a negative. An exposure of a bitumen plate in sight of the audience was of course impossible owing to the length of time required, but a plate exposed previously was developed in the optical lantern, a glass bath in which it was inserted being placed in front of the lens. This proved a failure, but a plate exposed and developed the day before was perfectly successful. The happy accident which led to one of Niepce's bitumen silver plates treated with iodine being exposed to the vapour of mercury, and the discovery of a developed image, was described, and two Daguerreotype plates were prepared and shown on the screen by means of reflected light. The clear and simple language of Professor Dewar, and the manner in which, step by step, the progress of photography was traced, cannot be too highly praised. On Thursday the collodion and gelatine processes were treated of, and tomorrow (Saturday) the influence and the advancement of photography will be the subject.

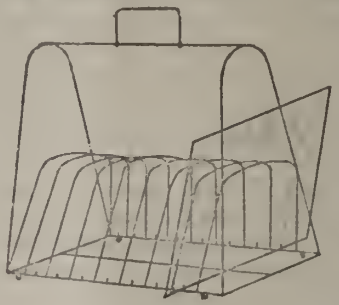
There are rumours that the excessive duty on works of art imported into America—amounting to thirty per cent.—is about to be relaxed. It is quite time. To show how perniciously this high duty acts, it is only necessary to state that photo-gravures are rarely seen in the United States, owing to the prohibitive price. Paris, at present, is the home of the photo-gravure, and until a rival establishment is set up in New York, or the duty is reduced, the Americans will know little of this most beautiful form of the photographic art.

SIMPLE WASHING AND DRAINING RACK FOR DRY PLATES.

BY LIEUT.-COLONEL J. WATERHOUSE B.SC.
Assistant-Surveyor General of India.

Having often experienced the want of a simple and convenient arrangement for washing and draining dry plates of various sizes, I found a modification of the common toast rack answer so well, that I am induced to think that a description of the apparatus may be of interest to some readers of the News.

The following diagram will explain the construction of the apparatus. It is made of iron wire well varnished with Brunswick black, and is just the same as a toast rack, except that the divisions slope backwards in order to prevent the plates falling forwards and the films being injured. The size and number of divisions will of course vary with requirements. I found it convenient to make mine fit a washing box for larger plates, so that I might wash plates of any smaller size in it. After the washing is ended, the rack is lifted out, and the plates allowed to dry in their places. When a proper washing box is not available, the rack can be placed in a bucket or any other vessel of water, or in a running stream, as may be convenient. It is desirable to have a centre supporting wire running along the bottom of the rack, and also to add four small projections like feet to raise it a little from the ground.



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UNBOILED EMULSIONS.

BY PROFESSOR SPENCER B. NEWBURY.*

Last April I contributed to *Anthony's Photographic Bulletin* an article entitled "Notes on Emulsions," in which an effort was made to give a simple and certain method of preparing photographic plates of any grade of sensitiveness, together with the results of many experiments made to show the effect of different conditions of time, temperature, and proportion of ingredients on the rapidity and character of the resulting emulsion. The only new suggestion of any importance which the paper contained was the method of securing a fine precipitate of silver bromide (in my experience the chief stumbling-block in emulsion making), which was accomplished by adding first the silver nitrate, and then the bromide, both in crystals, to a warm solution of gelatine containing alcohol. I have had several very gratifying letters from friends who have used this formula, all reporting complete success in working it, and great satisfaction with the resulting plates. There are, however, some interesting results to be obtained by using this emulsion in an unboiled condition, of which my original paper contained no mention.

All writers on emulsion-making insist that the emulsion shall be "red by transmitted light." This is a condition which implies great fineness in the precipitated silver bromide, and is very easily obtained by the method given above. In my earlier experiments, using other methods of emulsifying, I used often to obtain an emulsion of which a drop spread on glass and held against the light showed a reddish tinge, and used to suppose that the condition demanded had been secured ; but never, until I hit upon this method of mixing, did I see an emulsion which was "red by transmitted light" in the extreme sense of the phrase. The fineness of the precipitate obtained as I have described is such that a drop of the emulsion spread on glass shows a bright orange-red colour: a drop of emulsion mixed with a beaker of pure water imparts to it a pale blue opalescence, like that of some specimens of refined kerosene—an opalescence which does not disappear by subsidence even after standing for weeks. On boiling the emulsion, the particles increase in size, as is well known, and these peculiar qualities disappear. It occurred to me to try the use of this emulsion in an unboiled condition, principally in the hope of obtaining a fine plate, free from granularity, suitable for fine lantern slide work.

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* Read before the Society of Amateur Photographers of New York.

The operation of washing and making up an emulsion of this kind is the same as in the case of rapid boiled emulsions; the coated plates, however, present, after drying, a very different appearance. Even though quite a heavy coating of emulsion be used, the film, after drying, is so transparent as to permit the shape of a gas flame to be seen through the plate with ease; the film is extremely glossy, and when held against white light shows the peculiar orange colour of the freshly-prepared emulsion. All who have worked with wet plates will remember that they show nearly the same colour by transmitted light.

These plates are very slow, probably about as rapid as wet plates. They show a Warnerke sensitometer of 2 to 3, and in my hands require for an open view with Dallmeyer's rapid rectilinear lens, smallest stop, about ten seconds' exposure; whereas a rapid Stanley plate, showing 24 on the sensitometer, required an exposure of only one-half second. The resulting negative is, however, a very interesting and peculiar thing. The shadows are represented by absolutely clear glass as in a wet collodion plate, while the lights show every grade of transparent brown colour of increasing depth, like dark brown glass. These qualities, especially the perfect clearness, good colour, great density, and yet extraordinary range of half tones, and freedom from grain of any description, make the plate an almost perfect one for lantern slide work. For this purpose oxalate developer gives, I think, the finest results, although I have made beautiful slides with the pyro-potash developer. The colour of the slide is in either case a dark olive-brown, totally different from the cold grey tone which is always obtained with a rapid plate. The colour of the slide is in either case a dark olive brown, totally different from the cold grey tone which is always obtained with a rapid plate. The colour can be changed to a deep purple by a very slight intensification with mercury and sodium sulphite, but I do not think that this is any improvement in most cases. I have used many commercial lantern-slide plates, and though some of them are excellent, I have never found any that were in any respect superior to the plates made in the simple manner that I have described. The operation of preparing them is so easy that I have been able to train one of our students at Cornell to prepare the emulsion, coat the plates, and make slides from engravings or photographs, and he is now turning out three or four hundred slides a month for use in the various departments of the University.

As a general rule, it is probably better for the amateur or professional photographer to content himself with the plates which are to be obtained in the market, and not to encounter the many perplexities of emulsion making; but the operations of making these slow plates are so simple, and the results so certain and so gratifying, that I heartily recommend anyone who has become interested in lantern slides to try the experiment of making some of these plates for himself; and, after this task has been mastered, and the manipulations learned, a very slight change in the proportion of bromide used, and half an hour's boiling of the emulsion, will give a plate as rapid as any in the market. I shall be very happy to give any further information that may be desired to anyone who thinks of taking up this last accomplishment of photography, and can safely say that the pleasure of using the best commercial plates is far less than that of exposing and developing plates prepared by one's own hands.

The fineness of the precipitate of bromide of silver in the emulsion I have described depends solely on the method of emulsifying, and the amount of excess of soluble bromide present appears to have no effect on the character of these slow plates; but, if the emulsion is boiled, the proportion of bromide has a great effect. Using 32·5 grains of silver nitrate, I find that with 28 grams of potassium bromide, and half an hour's boiling, a very rapid plate is obtained (23·24 on the sensitometer), which has about the quality of the best commercial plates. With 25 grams of bromide, however, the plates are much less sensitive (15 on the sensitometer), but present almost exactly the qualities of the lantern-slide plates—*i.e.*, the same peculiar brown colour and fineness of the deposit. Plates so prepared are those which I prefer for landscape work.

I have made some interesting experiments with these lantern-slide plates made with unboiled emulsion. In the first place, it has been stated that the medium in which the silver bromide is suspended has a great influence on its sensitiveness, and that it is partly for this reason that gelatine plates are more sensitive than collodion. To test this matter I tried the experiment of soaking these lantern-slide plates in weak nitrate of silver solution, exposing them wet, and developing with an ordinary wet plate developer, consisting of a solution of ferrous sulphate made strongly acid with acetic acid. The experiments were successful; the plates developed quickly and without fog or stain, giving a result much like a wet plate, but with a more reddish deposit. The sensitiveness was about the same as an average wet plate. Hence it appears that the bromide of silver in an unboiled condition is no more sensitive when suspended in gelatine than in collodion.

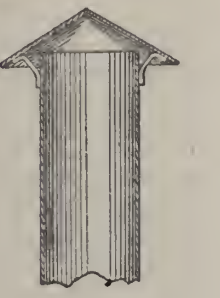
Secondly, it has been stated that the sensitiveness of gelatine plates over wet collodion plates is in part due to the fact that since the former contain no free silver nitrate, it is possible to use alkaline or neutral developers, *i.e.*, pyrogallol and ferrous oxalate, which were said to be more powerful than acid ferrous sulphate. I find, however, that if two of the plates be given equal exposure, and one moistened with nitrate of silver solution and developed with wet plate developer, the other developed directly with ferrous oxalate or pyro, the latter appears considerably under-exposed; showing that the mechanical development is more energetic than the chemical.

It is well-known that a rapid plate cannot be moistened with nitrate of silver solution, and developed with wet plate developer, without the appearance of fog and stain. The fact that slow plates, made from unboiled emulsion, may be so developed, shows that the cause of this fog is to be found in the decomposition of the gelatine during the operation of boiling. I find, in fact, that plates made from unboiled emulsion may be successfully intensified with pyro and silver, in the same manner as negatives made on wet collodion plates.

CHIMNEYS FOR ENLARGING OR MAGIC LANTERNS.

BY F. C. BEACH.

On making some experiments with enlarging lanterns, I found, when a powerful light was employed, which demanded a strong draft to keep it up, that if an ordinary chimney-pot, *A*, was cut placed on over the smoke-pipe, a very perceptible diminution of the light on the screen was observed, and was readily accounted for, from the fact that the upward draft of the heat was checked by impinging directly against the under side of the cone, and then escaping at the side.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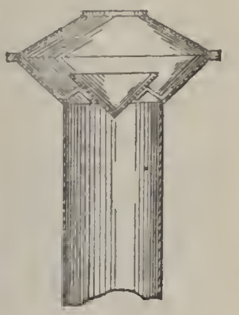
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In using an oil lamp for enlarging, every means should be utilized for favouring the free escape of the heat and promoting the draft. A long chimney is particularly useful. I have constructed the chimney top shown in *B*, which answers the purpose admirably. The upper end is enlarged similar to a locomotive smoke-stack, and over the centre of the pipe is held, by iron strips riveted to the pipe, a small inverted cone. As the heat ascends it is simply deflected slightly, and escapes, as if through an open pipe, while the light, at the same time, cannot escape, since the edge of the inverted cone slightly overlaps the circle of the smoke-pipe. The area of the upper opening above the cone should be the same as that of the smoke-pipe below. The smoke-pipe of the Amateur Society's optical lantern is constructed on this principle, and never fails to conduct the heat off perfectly. I commend it to those troubled with smoky lamps and imperfect combustion.—*Anthony's Bulletin.*

ON PHOTO-MICROGRAPHY.

BY W. H WALMSLEY.*

I CONFESS to some feelings of hesitation in appearing before you this evening with a paper on the above subject. "Walmsley's Bugs," as some facetious fellow-members have dubbed my occasional displays of microscopic objects, projected upon the screen by means of our optical lantern, may not prove to be an interesting theme to many of you, although its scope is boundless. But having been honoured by an invitation to read a paper here, I think it proper to choose a subject with which I am somewhat familiar, even at the risk of presenting one which may not be of special interest to all of you. If, however, I can be instrumental in turning the attention of even a single member toward this delightful branch of photography, I shall be amply recompensed for the slight labour involved in so doing.

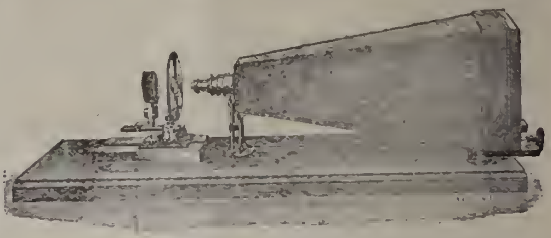
During the winter interregnum, when out-door work with the camera is generally uncomfortable, if not impracticable, we recall our past summer's experiences by making prints and lantern slides from the negatives obtained at that time; and many a pleasant day is repeated in retrospection thereby. Thanks to the general introduction of bromide paper, we are rendered independent of day-light for this work, a great boon to those whose only leisure comes in the long evenings of winter. The making of a negative is, however, to very many, even a greater pleasure than the print therefrom, and I venture to assert that more than one now present has many negatives in his possession from which he has never made a print, and probably never will; yet the desire to produce more negatives is never satiated. To such, the field presented by photo-micrography is an attractive one, full of novelties, of boundless scope, and readily entered upon by all.

Many of our members were but a few short years ago enthusiastic microscopists, until lured from their first love by her younger and more attractive sister, photography. Most of them retain their now unused microscopes and cabinets of prepared objects. They have all the necessary materials and appliances for combining the science and practice of microscopy with the practice and art of photography, and could produce work which would be of practical and educational value to themselves and others, if they would only do so. A general advance in this direction is being made all over our own country, as well as in Europe, and I should be greatly pleased to see members of our own Society joining therein.

The most simple method of making a photo-micrograph is by means of a small camera or box, carrying a sensitized plate placed above the eye-piece of the microscope. My first work of this kind was done with the so-called Pocket Camera of Walker; a small square box without bellows, carrying a plate 2¾ by 3¼ inches, the focussing of which was effected by sliding the tube carrying the lens in an outer one, fitting it loosely enough for that purpose. Whilst examining the eyeless flea of the mole, one winter's evening, I was seized with a longing to photograph it. Acting upon the impulse, I removed the lens tube from this little camera, and found that the outer one, attached by its flange to the front of the box, exactly fitted over the eye-piece of my microscope, throwing a brilliant and sharply-defined image of the flea upon the ground glass. A plate holder and plate were quickly substituted for the latter, and exposure made by guess work; the result being a fairly good negative, from which a lantern slide was subsequently made by contact printing, which will be shown on the screen during the evening. This was my first photo-micrograph, and opened up a new field, which I have since cultivated with both pleasure and profit.

This method of using the camera has since been elaborated by Dr. Mercer, of Chicago, and a little instrument bearing his name, attachable to any microscope, is now a regular article of sale by photographic stock dealers. It is a valuable addition to the accessories of a microscope, especially so to the biologist, who frequently in his researches finds some subject the preservation of whose outlines would be of great value, but which undergoes such rapid changes that no time must be lost in so doing. With camera and ready charged plate-holder at hand, an exposure can be made in a minute or two, and valuable details secured, which would otherwise inevitably be lost. The field of view, however, is extremely limited; only the centre of the very small plate is illuminated, and the entire results are of a temporary and unsatisfactory nature.

Later, Mr. H. F. Atwood, of Rochester, devised an apparatus for this purpose, combining both microscope and camera in one. Upon a solid platform is placed a cone-shaped box, having at the large end a focusing-screen and plate-holder, whilst the smaller end is terminated by a short brass tube with society screw, carrying any ordinary microscope objective. The focusing is effected by means of a rod passing under the body of the box to its rear, and terminating in a milled head. The glass slide carrying the object is clamped upon a circular stage firmly fixed in front of the object glass, the illumination being from a lamp placed behind the stage, the direct rays from which are utilized without the intervention of any mirror. This is a fairly effective piece of apparatus, its chief defect consisting in the absence of a bellows body: the focusing-screen and plate-holder remaining at a fixed distance from the object, requires a change of objectives for any necessary change in the amplification. It answers the purpose of its design fairly well, but cannot be recommended for general work.



Following my first experience with the Walker box placed over the eye-piece, the next advance in a practical direction was the employment of an ordinary view camera mounted on a tripod, and with the lens unscrewed from the flange upon its front. The microscope was placed upon a table with the body inclined to a horizontal position, the eye-piece removed, and the tube inserted into the body of the camera through the open flange; the tripod being adjusted at a proper height and position to suit the table. The entrance of extraneous light into the camera, through the open space between the tube and flange, was prevented by a piece of blackened card-board made to fit tightly to the microscope body. The lamp was placed on the table in the rear of the stage, and its light condensed upon the object by means of a bull's-eye upon a separate stand. The result of the first exposure with this contrivance (the subject being the tongue of a drone fly) was a negative full of fine detail, a vast improvement on my first attempt, but with a decided "ghost" in the centre, which you may see for yourselves, as it will now be passed around.

Since no authorities at my disposal threw any light upon even the existence of this "ghost," I was forced to seek its cause for myself, which I soon succeeded in doing; tracing it to reflections from the interior surface of the microscope tube. A cylinder of paper covered with dead black velvet, or wool flock, placed within the body of the microscope, completely exorcised my ghost, and I was troubled by it no more. And here it will be proper to say that in using any microscope for photography, with a body from which the eye-piece has been removed, it will be necessary to thus line the interior with some non-reflecting material, to prevent the occurrence of ghosts in the negative. If, however, the exposure be made through the eye-piece, the lining will not be necessary.

The defects of this form of apparatus speedily became apparent. The bellows extension was not sufficient to give much of a range of magnifying powers with any given objective; the tripod was not steady enough to permit the use of any but very moderate powers; whilst microscope and camera being carried upon separate supports, were not equally affected by any jarring of the building by passing vehicles or other causes; the result generally being negatives somewhat blurred, and wanting in the crisp sharpness which the image presented upon the focussing-screen. This led to the abandonment of the tripod, and the placing of camera, microscope, and lamp, upon a common platform, so that any tremor or motion was distributed alike to all parts of the apparatus, completely curing the blurring trouble.

The practicability of photographing microscopic objects by lamp light, even with very high powers, having been fully demonstrated, improvements in the form of apparatus and methods of manipulation followed. A special camera was devised, with a cone-shaped front, to receive the microscope tube, and with the bellows in two or more divisions, allowing a long extension of the same when increase of power was necessary, since the farther the plate is removed from the object, the greater the amplification with any given objective. The box and plate-holder were square, so that the plate could be exposed in either horizontal or vertical positions, as best suited the object upon the stage, without having to reverse the camera. The holder itself was a single one (for reasons to be given hereafter), carrying a half-sized plate (4¼ by 5½), and furnished with a kit for using a quarter-sized plate when the latter should be necessary. This camera was firmly attached to the platform upon which microscope and lamp were placed, and the whole apparatus was eminently practical and efficient. I used it for more than a year without modification, and remember it with a certain degree of affection, even in the presence of the more perfect and elaborate outfit which has supplanted it, and which I have the pleasure of exhibiting to you this evening.

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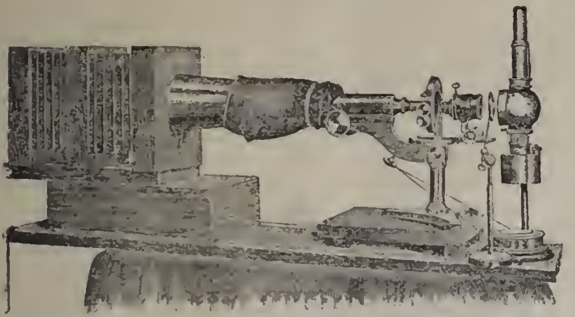
* Read before the Photographic Society of Philadelphia.



In this improved form of camera the general features of its immediate predecessor have been retained. Size and shape remain the same, but the long V-shaped ways upon which the bellows slide are made in two sections, for greater convenience in manipulation when only a short extension is required. The central section of the camera is fitted with a removable division, to which an ordinary rectilinear lens can be attached, access to which is had through a small light-tight door in the side of the box. The cone front may also be removed, and its place supplied with a board carrying a flange, to which the lens may be screwed, thus converting the box into an excellent copying camera. Kits to carry either half or quarter-sized plates, vertically or horizontally, are also supplied with this front, which is double-shifting, to allow the placing of any desired portion of a negative in proper position when a lantern positive is to be made. In short, the camera is now a most excellent enlarging, reducing, and copying one, in miniature, replete with every convenience and appliance to be found in the largest copying boxes made especially for that purpose. It is no longer necessary to make the negatives with a view to printing lantern positives by contact; they can be reduced or enlarged to the proper size in the camera, and are far sharper and better in every way than those made by contact in the printing frame.

(*To be continued.*)

ON CAMERAS AND FIELD APPARATUS.

BY H. H. O'FARRELL.*

For many years after the bellows-body (invented by Captain Fowke, R.N., in 1854) had superseded the old sliding-box form our cameras still continued, in the main, to be dominated by the old principle. They still consisted of two sliding-boxes, one carrying the lens and the other the dark slide, only differing from the primitive type by being connected together by a cloth or leather bellows. With the dawn of the dry-plate amateurs came a new era. They became the manufacturer's best customers. They were no longer obliged to take whatever the maker, catering mainly for the professional goose, thought good enough for the amateur gander.

Hence arose a new class of cameras, claiming to combine rigidity with the minimum weight. The type of the new form is the camera, now well-known, brought out about two years ago by McKellen. I think I shall not be far wrong if I say that this type of camera claims to obtain rigidity, not by additional bulk or weight of material, but by an improved disposition of the parts on mechanical principles.

The question arises how far the advantages of the new form are real, and whether, if real, they are obtained by the sacrifice of the good points to be found in the older cameras? This involves the determination of the points necessary to a perfect or ideal camera, on which I will venture to give you my views to-night, with the object, I would add, of eliciting, rather than imparting, information.

1. The first essential of a camera, I take it, is that it should be as light as is compatible with rigidity; not, as some makers seem inclined to read it, as rigid as is compatible with lightness. As far as I have tested them, the new form, with folding fronts and backs, in "triangular positions" (to adopt an inaccurate but sufficiently understood phrase) are as rigid as the old, when not too fully racked out. When, however, they are used at their greatest extension they seem to me hardly as rigid as the older forms.

2. Both vertical and side-swings are necessary in a perfect camera. The latter is not found in some of the new types, the makers conceiving that they get the same result by swinging the front, which is a delusion. In most of the new cameras the vertical swing starts from the hinge of the back, and not, as in the old forms, from the central line of the ground glass. Every time the swing-back is used on a new type of camera, the focus has to be readjusted. This is a distinct disadvantage of the new forms, as at present made. It is only fair to say, however, that the defect is not inherent, and might be remedied with ease. In fact, I have seen some new cameras to which the old form of swing was adapted in addition to the new.

3. It is important that the lens should be capable of motion both lateral and vertical. A much greater lateral motion than is usually given, even in the old cameras, is necessary, if two pictures are to be taken on one plate. In the new types the matter of lateral motion does not seem to have been sufficiently considered, though the vertical rise and fall is all that could be desired.

4. One requisite—not yet, I believe, supplied in any camera—is some means of taking smaller sizes of picture without recourse to the clumsy expedient of carriers. It might be easily done by an extension of the principle of the sliding-board commonly used for stereoscopic pictures. This board would carry grooves for the smaller sized double-backs, and would block out all the back, except the opening in the centre to receive the small slides. By this means the necessity for a second focussing-screen is obviated.

5. A fifth point of great importance is that there should be some means of arranging the camera so as to give both vertical and horizontal pictures. The old way of turning the camera over and re-screwing it was about as bad a way as was ever devised. Independently of the trouble involved, the camera was never sufficiently rigid in the second position—it was balanced, so to speak, on a knife-edge. The new way of making the camera square with a reversing-back is convenient, but adds bulk and weight. There are two other methods that have been tried. The first is to make the bellows revolve, and to have the back secured in a cradle, from which it can be detached and set up in the new position. This adds neither bulk nor weight, and seems to me, theoretically, the best way of attaining the desired object. The other method is to have a reversible tripod-head, to consist of two plates hinged together; the top plate, to which the camera is attached, being capable of being fixed at right angles to the lower one. The reversing tops now in the market possess the defect that, when used for the purpose of taking vertical pictures, the perpendicular from the centre of gravity of

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* Read before the Camera Club.

the camera may fall outside the base of the legs, unless they are straddled to an inconvenient extent. This defect is obviated by a new form of reversing-head, which will shortly be on the market. Whether these reversing-heads will supersede the reversing-back seems to me to depend mainly on the manner in which they are manufactured. If they are no heavier, or but slightly heavier, than the ordinary tripod-heads, there will be a considerable advantage in using them. If, on the contrary, the extra weight of the reversing-top is equal to the extra weight of the camera necessitated by the reversing-back, there is no advantage in the reversing-top. For those who do not possess the square form of camera, it will be, however, an adjunct of great utility.

6. Most new cameras are now made with a great extension of focus. I am not of opinion that this is very necessary for field work. The use of a long-focus-extension is mainly (1) for copying, (2) for portraiture. Both are operations that can be done at home by means of one of the "extension-fronts" that are supplied by some makers, or by studio and copying cameras, if the amateur can afford to possess them.

7. An improved method of focussing is very desirable. The focussing cloth is an abomination, only tolerated because it covers the defects of our double-backs. Combined with the new arrangement should be a means of seeing the picture in its right position—*i.e*, not upside down. A mirror hinged to a light frame, capable of attachment to the back of the camera the mirror to be set at an angle of forty-five degrees to the frame when in use, and attached to it by a triangular piece of cloth to block out side-light, is what I would suggest. When the picture has been satisfactorily composed, the apparatus would be removed, and the fine focussing performed by the ordinary focussing-magnifier applied to the ground-glass.

8. In the ground-glass itself, some improvement is desirable. The coarseness of the grain is very objectionable when magnified for focussing purposes. This is a great drawback where small pictures are taken for enlargements. Plain glass gives the most satisfactory image for the magnifier, but is not equally advantageous where the picture, as a whole, has to be judged of. Abney's "white wax, dissolved in ether and flowed over a plate," may make an excellent surface for studio-work, but it is hardly suited for the field.

9. A dark slide that will open inside the camera is a desideratum. Many such have been from time to time produced, but they all have the disadvantage of precluding the use of short-focus lenses. The double-back supplied by Brandel with his so-called "photo-revolver" seems to me excellent in conception, and I shall be glad to see makers adapting the principle to their cameras.

So much for the camera. As to stands, no great improvements have been made of late, if we except the turntable, which is, to my mind, a distinct advantage. The majority of stands take too long to set up.

A lens shade of some kind is, I think, a *sine quâ non* for field work. I know of nothing simpler than to use the focussing cloth, stiffened at the end by a piece of cane let into a seam, to cover the lens instead of the ordinary cap, and be lifted to form a lens-screen during exposure.

A good actinometer is still to be looked for. There are two kinds now in use, each with their own advantages and defects. The one measures the actinic light by the darkening of prepared paper; the other (chiefly used in France) measures the intensity of the image on the ground glass. The defect of the former is that the light of which it measures the actinic power, is not always the light which falls on the focussing-screen; the defect of the latter is, that it does not measure actinic rays at all, but visual rays. A combination of the two is, I think, wanted—an outside actinometer to measure the actinism of the whole body of light, and a visual actinometer (if the term may be allowed) to ascertain what fraction of the total body of light falls on the focussing-screen. Assuming—as we may do without great risk of error—that the actinism of the fraction is in the same ratio as the actinism of the whole, we get a better approximation than with either form alone.

I may add that I have recently seen an actinometer, or photometer, by Taylor, which professes to cut off all but the actinic rays by means of coloured media. What this measures, it seems to me, is not actinic power at all, but merely the visual brightness of the actinic rays.

Patent Intelligence.

Applications for Letters Patent.

17,073. Francis Robert Silk, 26, Brighton Road, Balsall Heath, Birmingham, for "Panels for letter racks, card racks, newspaper racks, music racks, photographic or picture frames, finger-plates."—30th December, 1886.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

4562 of 1882. L. H. Philippi, "Producing relievos."

Specifications Published during the Week.

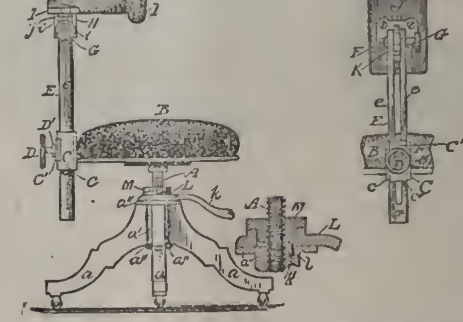
8654. Edwin Martin Knight, of 148, Cheapside, London, and George Henry Knight, of 11, Bernard Street, Russell Square, London, Photographer, for "A new or improved pocket photographic camera."—Dated 1st July, 1886.

This invention relates to a new or improved camera for photographing, specially designed for portability and storage in the pocket, and consists of a combination of sensitive plate and a pinhole lens; the latter is closed or sealed from the light before and after use, together with a containing and folding camera, the whole being so designed as to fold flat or letter like in form; is produced at very small cost, and is specially designed for storage in the pocket.

According to this our said invention we construct the sides top and bottom or "bellows" of the camera of paper, glazed calico, or other cheap, light, and readily folded material, the front being preferably of cardboard, and in the centre of which is a hole, behind which hole and on the back of the card forming the front of the camera is a pinhole lens, the hole and lens being closed or covered by an adhesive wafer or cover which can be readily removed; the rear end of the bellows is so cut and folded as to form a holding receptacle for the sensitive plate. The method of use is as follows. The pinhole lens being closed by the adhesive cover or wafer, and the sensitive plate placed in position, the whole can be pressed flat and placed in the pocket until required. Whereon the bellows will be extended and the cover removed from the pinhole lens, and soon as exposed a sufficient time, the adhesive cover or wafer will be applied over the lens hole, and the whole be pressed flat and returned to the pocket for after "developement" at leisure. It will be understood that a number of the improved apparatus may be compressed into the space of a few inches.

Patents Granted in America.

354,259. James H. Smith, Chicago, Ill., "Photographer's chair."—Filed March 26, 1886. (No model.)



Claim.—1. The combination of the vertically-adjustable bifurcated support E, having hand-screw G, with the arm-rest I, having slotted plate H, and head-rest J, having slotted plate K, the slots of said plates being open at the ends, whereby said arm and head-rest, respectively, are rendered interchangeably adjustable with the support E.

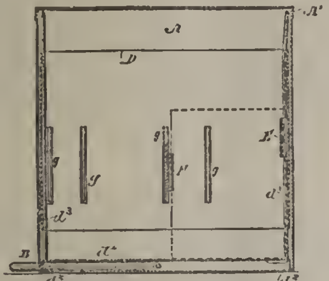
2. The combination, in a photographer's chair, of the support E, consisting of the parallel arms *e e*, the box C, having a moveable back piece, C', and the screw D, having thereon a collar, D', and passing through screw-holes in the said back piece and in the said box, respectively.

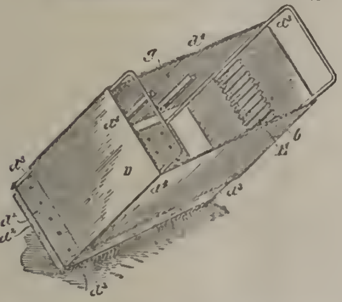
3. The combination, in a photographer's chair, of the usual seat-screw for adjusting the height of the chair, a screw-threaded socket attached to the chair-support for the reception of said seat-screw, a supplemental screw-threaded socket, one face of

which is oblique to its axis with means for preventing the same from rotating, and a loosely-interposed washer having a cam-shaped face conforming to that upon said supplemental socket, and one or more handles for rotating said washer.

4. The combination, in a photographer's chair, of a seat-screw, a screw-threaded socket for its reception, cam-nut M, loosely connected with said socket by means of a pin, k', and the interposed cam L.

354,344. H. Clay Price, New York, N.Y., assignor to the Scovill Manufacturing Company, same place, "Apparatus for washing photographic plates." Filed June 8th, 1886. (No model.)





Claim.—In an apparatus for washing photographic plates, the combination of a vessel, pipes for conveying water to and from the vessel, and a frame fitted within the vessel and consisting of a bottom elevated above the bottom of the vessel, and having a space between its bottom and its sides and ends, and racks for holding photographic plates while resting upon the bottom.

Correspondence.

TWO HINTS: CUTTING PLATES—DEVELOPING IN COLD WEATHER.

Sir,—I send a couple of hints, the result of experience, which please to make use of if you think they may be of service to your readers.

The first is—when it is necessary to cut gelatine-coated plates before or after development, first divide the film with one of the cutting wheels sold for cutting glass. The glass may then be cut without any fear of the film leaving the plate. The wheel is much superior, for this purpose, to the knife, as I have found the latter has a tendency, from its dragging action, to disturb the contact between the film and the glass.

The second is—in cold weather, instead of largely increasing the quantity of alkali in the developer, in order to get vigour, use water slightly warmed; full density can be obtained without staining the film. This plan suggested itself to me recently when I had taken a number of copies with similar exposure, and was called away before I could finish the development of them. On resuming work the next morning I could not get equal results with an increased quantity of ammonia, even when I used nearly double the quantity. As plates had had same exposure as those developed on the previous day, I put on my considering cap. It occurred to me that coldness of the developer might be the cause, and on securing the aid of a little water from the kitchen boiler the difficulty vanished, and all the plates remaining came up as well as those first developed.

Thinking that others might profit from my experience, I forward the particulars, and am, sir, yours truly,

Clare, Suffolk, Dec. 31, 1886. Thos. Stokes.

THE FORTHCOMING PHOTOGRAPHIC CONVENTION.

Dear Sir,—May I ask you to insert this letter, calling attention to particulars in connection with the general Photographic Conference to be held under the auspices of the Camera Club on the 8th February next.

By the courtesy of the Council of the Society of Arts, the use of its Hall in John Street, Adelphi, has been granted for the meeting. Captain Abney will preside, and will also read a paper. Other papers will be contributed by Messrs. Adcock, Burton, Pringle, and Traill Taylor.—I am, dear sir, yours faithfully,

G. Davison, Hon. Sec.

Camera Club, 21, *Bedford Row, W.C.*

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society took place on Thursday, the 30th ult., when W. H. Prestwich presided.

The contention of M. de Villechole at the last meeting of the French Photographic Society, that ordinary gelatine plates became accelerated if soaked in sodium chloride solution previous to development, was discussed, and the general opinion expressed was that the action was that of a restrainer, and a small proportion of salt introduced into the developer would act in a similar manner. The only member present who had given the suggestion a trial was J. B. B. Wellington, who soaked his plates in a 15-grain solution of sodium chloride. They were afterwards well washed before development, and as a result came up much slower than other plates of the same kind not treated in this manner.

A general conversation upon the merits and demerits of ready-sensitised papers then took place, after which the value of orthochromatic plates, and the better known agents employed for varying colour sensitiveness, became the subjects for discussion.

Camera Club.

On December 30th, a paper on "Cameras and Field Apparatus" was read by H. H. O'Farrell (see p. 13).

Francis Cobb occupied the chair, and, in introducing the discussion on the lecture, remarked that the subject had been covered in the most complete and interesting manner. He thought the old square form of cameras with fixed fronts was still the best in small sizes. As regards the camera stands, he feared they were being made much too light now. Dark slides, too, were not what they might be. He knew of one that had been recently invented, constructed of steel, which, if brought up to its promise, would be a perfect double-back. There might be danger of engendering heat, but it was perfectly safe as regards light.

Dr. Lindsay Johnson referred to the method explained by the lecturer for doing away with inner carriers in large-sized cameras, and remarked that this plan was largely adopted by Mr. Frith.

Mr. Ferrero thought that a long focus camera was sometimes very necessary in the field, and useful for bringing into service the back combination of the rapid doublets. He exhibited a camera by Messrs. Sands and Hunter, in which the back was swung horizontally and vertically by rack-and-pinion movements.

E. Cocking, at the request of the chairman, explained the construction and working of one of Brandel's photo-revolvers, which he had been kind enough to bring to the meeting.

Mr. Gifford pointed out that nothing had been said in regard to the fixing of the lens, and showed a simple means of securing the lens to the camera-front, in which, instead of the usual screw, a bayonet catch was used, and the lens put into position by a slight turn.

On 13th January, the subject for discussion will be "Negative Films," when Surgeon-General Ranking will read a paper.

Talk in the Studio.

THEALE PHOTOGRAPHIC EXHIBITION.—This will be opened on Friday, January 28th, by W. G. Mount, M.P., and all exhibits must be delivered before the 21st instant.

MANCHESTER PHOTOGRAPHIC SOCIETY.—The first popular meeting of the Lantern Section was held in the large room in the Memorial Hall, Albert Square, December 22nd, Mr. J. Schofield in the chair. Abel Heywood, jun., contributed the first portion of the exhibition, which consisted of upwards of sixty slides from photographs taken by him during a tour in Hardanger Fjord, Norway, last summer. The members' summer work was next shown, and consisted of upwards of one hundred and fifty views. There was a large attendance.

A CYCLISTS' LIFE BOAT.—Henry Sturmey, the editor of the *Cyclist*, is receiving subscriptions for a life boat fund, and those of our readers who are cyclists are invited to contribute. Excellent progress has been made with the subscription as far as the present.

NEWCASTLE-UPON-TYNE MINING, ENGINEERING, AND INDUSTRIAL EXHIBITION, 1887.—*Special Photographic Section*—The following medals are offered by the Newcastle upon-Tyne and Northern Counties Photographic Association, and will be awarded in the various classes herewith mentioned in a section specially reserved for them under the following conditions:—An entrance fee of 5s. to be paid by each exhibitor on making application. All pictures for exhibition must be sent mounted and framed. On the back must be affixed the artist's name, address, the title of subject and process by which produced, together with a label attached with a copy of all particulars. *On no consideration will any name or other particulars be permitted on the front except the title*, as such will appear in the catalogue. Pictures in Oxford frames will not be admitted. The Committee undertake to unpack, repack, and return exhibits. All carriage must be paid by the exhibitor. The utmost care will be taken of the exhibits, but at the same time the Committee will not hold themselves liable for any accident that may occur. The Committee reserve the power of rejecting any picture or pictures. Each exhibitor must fill up the form A, and forward it to the Secretary, Exhibition, Newcastle-upon-Tyne, not later than January 31st. All pictures intended for exhibition must be delivered, carriage paid, not later than April 14th, 1887, addressed, E X, Newcastle-upon-Tyne, Photo. Section (in red paint). Form B being sent as letter of advice. *Class* 1—One gold and one silver medal for the best and second best series of (not fewer than six) portraits which, in the opinion of the Judges, possess the highest degree of merit irrespective of size. *Class* 2—One gold and one silver medal for the best and second best series of (not fewer than six) landscapes which, in the opinion of the Judges, possess the highest degree of merit, irrespective of size. *Class* 3—One silver medal for the best single landscape or marine view, not being a prize picture in the other classes. *Class* 4—One silver medal for the best figure study, either direct or enlarged, not being a prize picture in the other classes. *Class* 5—One silver medal for the best genre picture. *Class* 6—One silver and one bronze medal for the best and second best series of (not fewer than six) vitrified ceramic enamels. *Class* 7—One silver and one bronze medal for the best and second best enlargement, subject optional, not to be less than 15″ by 12″. *Class* 8—One silver and one bronze medal for the best and second best series of (not fewer than four) instantaneous views. *Class* 9—One silver medal for the best architectural view, exterior. *Class* 10—One silver medal for the best series of (not fewer than four) interiors. *Class* 11—One silver medal for the best picture by a photo-mechanical process.—C. Kenrick Gibbons, Secretary, telegraphic address: "Exhibition," Newcastle-upon-Tyne.

SOCIETY OF ARTS.—The following arrangements have been made for the meetings of the Society of Arts. Ordinary Meetings.—Wednesday evenings, at 8 o'clock:—January 19, "Cameo Cutting as an Occupation," by J. B. Marsh; January 26, "Photographic Lenses," by J. Traill Taylor; February 2, "Electric Locomotion," by A. Reckenzaun; February 9, "Adulteration of Beer," by A. Gordon Salamon; February 16, Handicraft Training," by Henry H. Cunynghame; February 23, "Recent Advances in Sewing Machinery," by John W. Urquhart. Amongst the papers for which dates will be hereafter announced are, "Miners' Safety Lamps," by Edward H. Liveing; "Development of the Mercurial Air-pump," by Professor Silvanus P. Thompson, D.Sc.; "Machinery and Appliances used on the Stage," by Percy Fitzgerald; "Textile Fibres in the Colonial and Indian Exhibition," by C. F. Cross; "Irish Industries," by Rev. Canon Bagot; "Progress in Telegraphy," by W. H. Preece, F.R.S.: "Railway Brakes," by W. P. Marshall; "The Living Organisms of the Air: the Effect of Place and Climate on their Prevalence," by Dr. P. Frankland; "The Cultivation of Tobacco in England," by E. J. Beale. Indian Section.—Friday evenings, at 8 o'clock:—January 21, "The Upper Oxus," by Trelawney Saunders; February 11, "The Economical Condition of India," by Dr. Watts, C.I.E.; March 4, "Our Trades Routes to the East," by Major-General Sir F. J. Goldsmid, K.C.S.I., C.B.; April 29, "Village Communities in India," by J. F. Hewitt. Foreign and Colonial Section.—Tuesday evenings, at 8 o'clock:—January 25, "New Zealand Scenery," by Kerry Nichols; April 19, "South Africa," by Major-General Sir Charles Warren, G.C.M.G.

PHOTOGRAPHIC CLUB.—The subject for discussion on January 12th will be "Photographing Snow Scenes."

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

C. & E. H.—Charge a stiff tooth-brush with Indian-ink, and scrape the face of the brush with a card, so that the bristles, on springing back, project a fine spray of the pigment. By allowing this spray to fall upon a varnished negative, and exercising a little care in masking out parts here and there, something which may pass muster as a snow portrait can be produced. It is easy to remove the pigment with a damp cloth.

DONALD CAMERON.—It is scarcely to be supposed that the American dealers are so behind as not to be in a position to supply them; but we cannot speak with certainty. There is a Customs duty, but the amount is not large.

H. S. & Co.—The name is unknown to us.

S. B.—It is quite possible that you have under-exposed. Try a much longer exposure, and do not use the developer too strong.

E PEPPER.—There are several ways of doing it; but we think that the one you refer to is that described on p. 402 of the NEWS for 1883.

A. J.—1. In an exceptional case, it may make no great difference; but, as a general thing, the advantage of taking the latter course is considerable. 2. It is because the organic matter slowly reduces the gold, and causes it to fall at the bottom of the vessel as a purple precipitate.

W. A. NICHOLAS.—The system you allude to seems to be a very stupid one, and it is to be hoped that better arrangements will be made for the future.

G. MORRISON.—We do not think you will just yet find a process which fulfils all your conditions; but one of the best hitherto devised is detailed in the YEAR-BOOK.

CHLORIDE.—There is no convenient way of throwing it down as chloride, but you can precipitate it as sulphide by adding a solution of sulphide of sodium or of sulphide of potassium. The sulphide can then be collected upon a cloth filter and reduced by fusion with carbonate of sodium.

PERMANENT.—"Das Gesämmtgebiet des Lichtdrucks," by Husnik, published by Hartleben, of Leipzig. The book costs something under five shillings, and gives full particulars.

PUZZLED.—1. If a solution of common salt gives no white precipitate, silver is not present. 2. The tint you speak of may arise from the action of light on a small quantity of chloride of silver suspended in the liquid; but without further particulars we can do no more than conjecture.

C. R. B. D.—The process you describe will give a block if the manipulator is sufficiently skilful in a number of rather difficult manipulations; but in any case the block will not be one of the sort which prints well, as the tops of the lines will be rounded off. For good printing they must be quite flat, and with clearly defined edges. You had better work according to the directions in the YEAR-BOOK, p. 187. Write concerning any difficulty. Thank you for the developing formula.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

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COATING PAPER OR SIMILAR MATERIAL WITH A GELATINOUS PREPARATION.

Now that paper coated with a gelatine emulsion has attained a recognised position in photography, both for the production of negatives and of positives, and become a stock material among the articles used by the photographer of to-day, any points relating to the coating of such paper possess special interest.

We now are about to describe a means of coating bands of paper with gelatinous preparations, which is equally applicable to emulsion papers and to carbon tissue, and which, as far as we know, has not been published before.

Two strips or bands are coated together, and they are placed in close contact, while wound or drawn through the gelatinous preparation contained in a trough or other suitable vessel. In the trough it is convenient to fix a rod or roller, this rod or roller being entirely immersed in the gelatinous preparation. Supposing that the bands to be coated are short ones—say about four feet long—the whole operation of drawing the double band under the roller can be done with the two hands. As regards getting the first end of the double band under the roller, one of two courses may be taken. First the rod or roller—or at least one end of it—may be made so as to be readily lifted, when the end of the double band can be readily placed underneath. Second, the edges of the two bands are cemented together at the end which is to go first under the roller or rod : it can then be taken hold of by a pair of nippers, and drawn up on the other side. In cementing the edges together it is convenient to use a cement which does not cause the paper to swell, such as india-rubber solution. If the band is very short it may, in some instances, be convenient to cement the edges of the bands together all the way along. With a long band this is never required, as while the double band is being drawn through with a proper tension and at a moderate rate os speed : as the two bands of paper are then kept in such close contact that nothing penetrates between them.

In working such a process of coating on a larger scale, it is practically convenient to draw the two strips or bands of paper off two distinct rollers, and to allow these bands only to come in contact with each other immediately before they pass under the rollers in the trough containing the liquid mixture with which the paper is to be coated. The two strips—of which each will now be coated upon one side—may be separated immediately after being withdrawn from the coating trough ; or they may, if convenient, be separated after the material is dry.

Sometimes, instead of merely having one roller in the fluid with which the paper is to be coated, it is convenient to have several, and to allow the double strip of paper to run over, under, or against each of these. The use of several rollers or fixed bars has the advantage of removing any bubbles which may form on or adhere to the surface of the papers.

It may be mentioned that when the paper is tolerably strong, fixed bars are to be preferred to rollers in the coating trough, as the steady tension created by drawing the paper between the bars serves to prevent the composition reaching the back.

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DR. EDER'S YEAR-BOOK.

The photographic world is really much indebted to Dr. Eder for the admirable year-book he has just issued through the publishing house of Knapp, of Halle.* By the careful selection of a suitable thin and hard quality of paper, Dr. Eder has managed to compress 348 pages of reading matter into a thickness of half an inch—and, indeed, this thickness includes no less than seven inset illustrations on thicker paper.

As regards the quality of all this mass of matter, it would be difficult to speak too highly ; indeed, we can best do it justice by saying that no photographic experimenter who reads German can afford to be without the book.

Perhaps the best feature is the very great amount of information conveyed in a tabular form ; indeed, no less than 100 pages are occupied with the tables. Specific gravity tables, including saline solutions of definite strengths, form a feature, and all the usual chemicals are included. Then we have alcohol and solubility tables, wave-lengths and speed of light, details as to the spectrum, diathermancy tables, and a mass of condensed optical information ; in fact, a list of the tables would occupy more than a column of our space.

The articles in the body of the book do not, by any means, form a chaotic mass of patchwork, but are made to thoroughly reflect the work of the year by a series of monographs on definite branches of photographic progress.

Geldmacher contributes an interesting and comprehensive article on the various applications of the pigment process, and in the course of this he touches on a point which may give a useful hint to some of our amateur and commercialist readers who are on the look-out for novelties for window decoration. A carbon print makes a capital resist against the sand-blast, but the glass plate upon which the carbon print is developed should be previously rubbed over with a weak solution of silicate of soda so as to ensure adhesion of the gelatine relief, and, moreover, in order to make the image soft, the plate should be flooded with glycerine, all excess being removed with blotting paper. The sand blast scarcely attacks the softened image, but rapidly bites into the glass.

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* Jahrbuch fuer Photographie und Reproductions-technik, fuer das Jahr 1887. Von Dr. Joseph Maria Eder. (Halle, a. S., W. Knapp.)

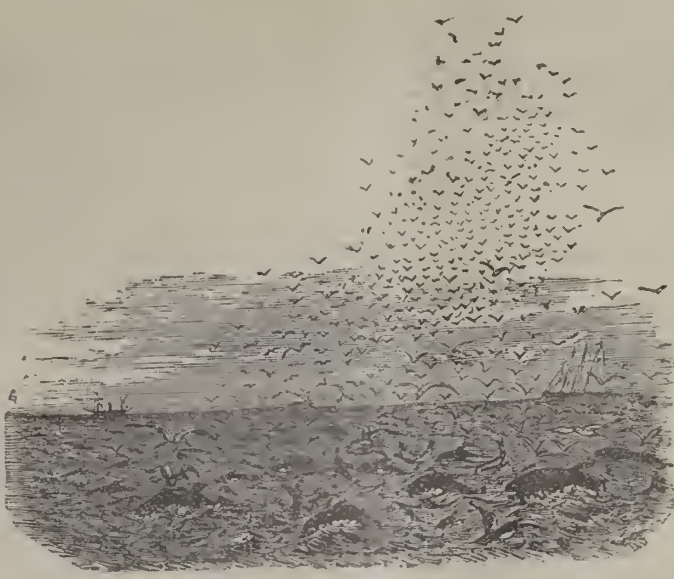
SEA-GULLS.—PHOTOGRAPHED BY C. T. [illegible]ALLIN.

PHOTOGRAPHING SEA-GULLS.

In sending us the photograph which is reproduced on the opposite page, C. T. Mallin, of Southport, writes :—

"The managers of the Pier have a practice of feeding the sea-gulls during the winter months from the end of the Pier, as an attraction to the visitor, and a very pretty and novel sight it is, and has tempted many photographers, both amateur and professional, to try their skill on them, but, so far, this is the only successful attempt. I might say that this negative was taken under somewhat adverse circumstances, as the sun was obscured at the time by clouds. The negative was taken on one of the Derby Dry Plate Co.'s ordinary plates."

This, like many other photographs of animals taken during rapid motion, shows how incorrect are some of the conventional representations adopted by artists, and the small block at the side is intended to illustrate this. It is a reproduction of a sketch from Lady Brassey's *Sunshine and Storm in the East*, and shows a water party in which flying fish are near the surface of the water, and gulls are shown in the air. The birds are drawn in the usual V form, a form which does not occur once in Mallin's photograph.



SEA-GULLS AS CONVENTIONALLY REPRESENTED BY ARTISTS.

HOW TO WORK STANNOTYPE.—No. III.

BY WM. LANG, JUN., F.C.S.

Having now got our tissue sensitised, the next operation, the printing of the negative relief picture, falls to be considered. The transparency, which should have received a protective coating of varnish, having been placed in the printing frame, the tissue is laid carefully down upon it, and on the top, before placing the usual pads, it is advisable that a piece of oilskin paper, cut to the requisite size, be laid on the tissue. The actual printing need not be considered in detail. On account of the more transparent nature of the tissue a visible image, somewhat faint, is imprinted. After a little experience this will be found sufficient to go by. At first, however, it may be well to judge the printing by means of the actinometer as in actual carbon printing. In Woodbury's Manual of Stannotype, development is recommended to be made on a collodionized glass plate. In practice, however, a coating of insoluble gelatine is preferable, the collodion coating, notwithstanding all care, being liable to come away from the glass. Should collodion be used, it is advisable to give an edging to the plate with a coating of india-rubber solution. The glass on which the relief image is to rest must be of good patent plate, half an inch larger each way than the opening in the mask of the transparency. On taking the exposed tissue from the frame (the collodionised plate, or the plate with the insoluble gelatine, having in the first instance been immersed in water) it is plunged into water and allowed to remain till it lies perfectly flat, not longer. The plate and tissue are then brought together, a mackintosh cloth laid over the whole, and the squeegee brought firmly to bear thereafter. A glass plate corresponding in size to the one we are working with is placed on the top, and on this a heavy weight is allowed to rest for not less than a quarter of an hour. On removing the weight and cloth, the tissue-bearing plate is transferred to hot water, the temperature of which should be about 110° F. By-and-bye, the paper which was attached to the tissue will disengage itself, and the development of the image will commence. Owing to the greater thickness of the film, this is a much more protracted affair than the analogous development of an ordinary carbon picture, hours being required for the formation of a proper mould, where the same number of minutes would have sufficed to produce a pigment picture. Three to five hours may be required, but if an opal plate be placed on the back of the patent glass plate the picture shows up as a negative, and the extent to which washing must be carried will be thus accurately made manifest. It is here the necessity of having a certain amount of colouring matter present in the gelatine becomes apparent ; without it, the relief picture would appear to be only so much soft gelatine, and no clue could be had as to whether sufficient washing had been given so as to secure satisfactory results. In fact, when the washing has been carried sufficiently far, the picture at this stage appears anything but promising ; but this need not trouble us, for if the picture, when viewed as a negative by means of the opal plate as already described, presents the appearance of the original negative, all will be right when the relief is dried. It is as well, therefore, for the sake of comparison, to have the original negatives beside one, in order to judge when to discontinue the washing. It is scarcely necessary to state that the water, all through the operation, must have been maintained at a temperature of 110° F., or thereby. It is customary to finish off with a washing with cold water. Having done so, and allowed the relief to drain for some little time, our next procedure is to immerse it in a solution of fresh methylated spirit, where it is allowed to remain for several hours. On taking it out the gelatine will dry very quickly, and when dry, and before protecting it with the tinfoil, any defects due to transparent spots in the transparency can be removed by means of a small strip of glass broken clean across, forming, as it were, a species of chisel. A thin solution of india-rubber, either in benzol or chloroform, is poured over the surface of the mould, after the manner of collodionising a glass plate. When this is dry, a thicker solution of rubber in either of the solvents before mentioned is applied by means of a brush to the edges of the plate. A piece of tinfoil cut to the size of the glass plate, free from holes, is now flattened out by means of a velvet brush, or a piece of velvet put over the forefinger will answer the same end. Having placed the foil down on the mould, unless we happen to have a domestic wringing machine in our operating room, a journey will have to be made to the wash-house to complete our operations. Having opened out the rollers by unscrewing the top main screw, we introduce the glass plate between the rollers, supporting the upper one till the centre of the plate rests on the lower roller. The screw is then tightened, and the handle of the press worked gently backwards and forwards, the motion extended each time till both the edges of the plate have been reached. On removing the glass from the machine, we should find that the tinfoil has taken the impress of the mould. We are now ready to commence printing operations, to be described in our next.

WINTER WORK.

BY C. BRANGWIN BARNES.

Now that we are fairly in the midst of the dull, dark days of winter, when sitters are few and the printing proceeds but slowly; when the outgoings do not decrease in nearly a proportionate ratio to the incomings; now is the time for the photographer, be he employer or employée, master or man, to look around him and prepare for the bright days to come. And not only to prepare for the coming season, but to do those things which he has, perforce, left undone during the season passed. There are the negatives of the spring and summer of 1886 to store away in safety, and in a manner which will ensure any individual one of them being easily traced and found, in the event of an extra order; there are copies and enlargements to be made; and there are apparatus and accessories to be seen to and repaired. The lens, being *primâ facie* the chief implement in the hands of the follower of the photographic profession, deserves first notice; it can now be seen to, not that the lens itself requires much seeing to, but the stops are part and parcel of the lens, and the wear and tear of a single season's work is ofttimes sufficient to wear away much of the black covering with which they are coated, and so cause a certain amount of light to be reflected on the plate. These may be re-blacked, either by coating them carefully with Bates' black, or by one of the numerous processes technically known as lacquering or japanning, which is generally effected by washing or brushing over the articles requiring blacking with a hot metallic solution, the component parts of which can be obtained from almost any old *Photographic News Almanac.* Where a cap is used to the lens, the renewing of the inner band of felt may be attended with advantage, and the instantaneous shutter may not be amiss for a little looking to. Then comes the camera itself, which should now be thoroughly overhauled and made perfectly light-tight, and its interior, if necessary, re-blacked. Dark slides, too, should now be thoroughly and carefully examined, and any defects made good. The dark room should be thoroughly overhauled and cleared up; old useless bottles and jars, either empty or containing solutions and chemicals not now in use, be thrown out, and either destroyed or stowed away in some other place; and everything arranged ready for use. Backgrounds, chairs, tables, rockwork, grass mats, and in fact all the general apparatus and accessories, should be inspected and put to rights; while in the printing department there is always work to be found replacing broken springs and defective backs to the pressure frames, manufacture of a stock of vignette boards, burning and reducing of wastes, to say nothing of the storage of negatives, and a hundred other minor things appertaining thereto.

Then comes the great question as to whether some little increase cannot be made in the ordinary winter takings, by the introduction of some line or lines of business for which in the summer we have no time, of which useful commodity we have now enough and to spare, and which we would fain turn into money. Many a photographer, if he sets his brains to work, will discover more than one way of so doing, and I may perhaps be allowed to instance one or two which strike me as being applicable to all business, and more especially to those which have an enlarging plant attached.

There are few, if any, photographers who cannot reckon among their *clientèle* some few sitters who aver one special portrait to be the best they have ever had taken, and whose constant re-orders from that special carte or cabinet negative verify their belief in the same.

Now is the time to look out all such negatives and make tasty enlargements therefrom, varying in size and style, according to the social standing and worldly welfare of the subject, or his or her family and connections. These can easily range from, say, the whole plate, monochrome or water colour opal, to the 24 by 18, or the kit-kat oil painting, or carbon portrait worked in monochrome; and it will be found that if these are submitted on approval, at a moderate and fairly remunerative price, they will, in nearly every case, be purchased, and those few that are not, will not be wastrels, for the addition of new specimens every season will be found to add materially to one's business.

NOTES ON THE ART GALLERIES.

BY WIDE ANGLE.

If not so interesting to the general public as the old masters at the Royal Academy, the Van Dycks at the Grosvenor are quite of equal interest to portrait photographers. A collection of one man's paintings, while it makes his mannerisms prominent, shows also his genius in a strong light. Only the very greatest artists come out of the test satisfactorily, and of the few who do so, Van Dyck unquestionably takes first rank. To the superficial observer these repetitions of cavaliers in full court dress, or in armour, of smiling beauties arrayed in satins, brocades, and costly lace, may appear monotonous, but to the artist each one has its charm. Court painter as Van Dyck was, he rarely sank his individuality, and every portrait in this very unique collection bears the aspect of nature, with no doubt a trace of skilful flattery, but never so much as to destroy the likeness.

Van Dyck was fortunate in living at a time when costume was exceedingly picturesque. How much the fashion of that day owes to Van Dyck cannot be estimated; but that it owed a good deal is certain. As a writer in the *Quarterly Review* well said forty years ago, "Van Dyck, like Holbein, seemed to lock the wheels of fashion for a time, and has bequeathed a distinct type. The great grandchildren of those who had sat to Holbein now sat to him, but as differently apparelled as can well be imagined. Hair playing, drapery flowing, dropping laces, delicate linens, glossy silks—the stiff, wide, standing petticoat, supplanted by a slender, lengthened train—the head, the throat, the bust, the arms, all bare—the coutour of the figure all given, except where some rich drapery, secure in its own strength and glittering in its own light, wandered apparently at random across the figure, and was either caught up by a massive aigrette, or fell in ponderous folds below—a costume of apparent ease but of infinite care—one which Vandyke alone seems to have been entitled to paint, and the young and lovely to wear."

The Grosvenor Gallery collection amply confirms this view, and the glamour of romance which Van Dyck threw into his work compels one to sympathise with the Royalist party even when reason sides with the Puritans. The portraits of Charles I., of which there are no less than nine in the Exhibition, show this forcibly. The mixture of weakness and obstinacy is unmistakable, and yet there is a kingly dignity which exacts respect. It is worthy of note that although Van Dyck varied his presentment of the King's features and expression according to the different periods when the pictures were painted, the same man appears in each, and we may therefore be sure that in these portraits we see a veritable likeness. On this point, F. G. Stephens, who has compiled the exceedingly interesting notes in the catalogue, says, "Some writers have affirmed that Van Dyck continued for nine years, the period of his sojourn in the King's service, to paint his Royal patrons according to the type (*ébauche*) he had adopted at an early date. This idea is quite untenable in face of the fact that the great group of 1632, and the superb portrait now at

Dresden, to say nothing of the several specimens before us here, differ in their traits as much as time's flight required they should differ, while not a few of the pictures gain pathetic expression by clearly suggesting how much trouble, contests, and anxiety, had already told upon the Royal pair."

The portraits of Henrietta Maria are not less interesting than those of Charles. The one where she is represented with her dwarf, Sir Jeffrey Hudson, is full of animation, and has a certain quaintness which is very delightful. Nos. 150 and 94 are both worthy of careful observation. No. 21 is a wonderful study of a white satin dress. The Queen's hands are, however, very mannered. Van Dyck's treatment of the hands cannot fail to be noted by the portrait photographer, who well knows how difficult it is to dispose of the extremities satisfactorily. Van Dyck cut the Gordian knot in a very summary fashion. He rarely troubled himself about giving the hands occupation. It is sufficient for him to pose them gracefully, and much as a study in a drawing-book, and there he left them. He had apparently two favourite arrangements. In one the hand has an appearance which can only be described as "curly." Examples of this treatment are found in the portrait of Sir John Borlase (No. 3), in the portrait of a lady (No. 6), and in the hands of Snyders, the painter. The fingers in all these are spread out like a fan, and affectedly curved. But this arrangement is far less common than the one wherein the fingers have a V-shaped separation between the second and third. A very frequent pose is the arm bent almost at right angles, the hand brought in front of the body, and the fingers separated in the way described. This mannerism is fully explained by the fact that the painter rarely drew the hands of his sitters, but gave them the hands of professional models. For this reason the hands in Van Dyck's portraits are nearly always weak and characterless. This would now-a-days be considered a serious drawback, and indeed the practice would not be tolerated; but doubtless Van Dyck's aristocratic patrons were delighted with the taper fingers and the plump palms with which he endowed them.

It is impossible in a limited space to mention even a small number of the portraits which deserve notice. Among the more striking ones I find I have noted a portrait of a Spanish officer (No. 68), a wonderful costume picture finely and vigorously painted, and devoid of affectation in the pose; Inigo Jones (No. 62); Madame Kirk (No. 58), a marvellous rendering of a lady in an amber satin dress; the adjoining picture (No 57), Algernon Percy, tenth Earl of Northumberland; Cæsar Alexandre Scaglia, a magnificent picture, albeit the head seems too small for the figure; Thomas Killigrew (No. 50), John Lord Finch, of Fordwich (No 33); Paul de Vos, the painter, (No. 14); and the Genoese General, Ambroglio Spinola, Duc de San Severino, commander of the Spanish armies in the Low Countries, remarkable for the painting of the armour. The portrait of William Feilding, first Earl of Denbigh (No. 100), in the second room, should also not be overlooked. It is notable from its being one of the few portraits not in what may be termed "full dress." The Earl is bareheaded, and wears a coat of a dull red; over his shoulder is slung a belt; and he wears a pair of strapped low shoes akin to those which are now worn by very young children. Apart from its artistic value, as a representation of a country gentleman's ordinary attire in the time of Charles I., the picture is extremely interesting.

Van Dyck had the happy power of being able to endow his lady sitters with youth, though no doubt the costume with the waist almost as high as the armpits, and the fashion of the hair playfully curling over the head, assisted him much in this respect. With this tendency he ought to be very successful with his portraits of children. And so indeed he is, but in a quaint way. While his women have an engaging infantine air about them, his children have a strange grown-up look. They are men and women in miniature. They are obviously standing to have their portraits taken, but such is Van Dyck's charm of treatment, you would not have them otherwise than they are.

While one would not like to part with a single portrait painted by Van Dyck, his other works show such consummate mastery of colour, knowledge of anatomy, and richness of imagination, that had he not been fettered by the demands made upon his time by the fashionable world, he would certainly have rivalled, if not surpassed, his master Rubens. Armida and the Sleeping Rinaldo (No. 19), the Betrayal of Christ in the Garden (No. 125), and Christ giving the Keys to Peter (No. 137), all painted before Van Dyck gave himself up to portraiture, give sufficient promise of this.

Van Dyck's early method of portrait painting contrasts curiously with that which he was obliged to adopt when he was inundated with sitters, and had to work incessantly in order to live in style, and make good the arrears of his salary as painter to the Court—a salary which the impecunious Charles always had a difficulty in paying. Sir Peter Lely writes of the sittings of Nicholas Lanière, the sight of whose portrait induced Charles to invite Van Dyck to come to England, thus: "Mr. Laniere himself told me (Lely) he satt seaven entire days for it to Sir Anto, and that he painted upon it of all these seven days, both morning and afternoon, and only intermitted the time they were at dinner, and he said likewise that though Mr. Laniere satt so often and so long for his picture, that he was not permitted so much as once to see it till he had perfectly finished the face to his own satisfaction." A useful hint the last few words convey to portrait photographers. In England, when in the zenith of his fame, we are told that he never worked more than an hour at each portrait. When this time had expired he politely bowed out the sitter, his *valet de chambre* brought him another palette, cleaned his brushes, and a new sitter was introduced at the appointed time. He worked in this manner upon many portraits in one day, and he painted with extreme rapidity. "Having made a slight sketch for a portrait (the face only, of course) says De Piles in his *Cours de Peinture*, he placed his sitter in the attitude he had previously arranged, and upon grey paper, with black and white chalks, he, in a quarter of an hour, drew the figure and costume, designing them in a grand style and with exquisite taste. This study he then gave to his able assistants, who copied it on a large scale, and, aided by the dresses of the sitter, which were at the master's request sent to them for the purpose, worked out the draperies to the best of their abilities. Van Dyck went dexterously over the painting of his assistants, and very quickly produced, by his great skill, the art and truth which we all admire." How like this system is to that of a large photographic establishment, which, by a sub-division of labour, turns out a vast number of portraits, all exceedingly good, but looking as if manufactured in one mould! Van Dyck avoided the aspect of manufactured art, but could not always conceal the inevitable mannerisms which come from hasty work.

INSTANTANTANEOUS STUDIES.

No. 5.—He would be a Photographer.

Photographer. You wanted to see me.

Applicant. If you please—on most important and particular business.

P. Oh, then, you do not want to sit for your portrait.

A. Not at all. This is how the matter stands. You see in me a most unfortunate man.

P. (uneasily). I hope you will not keep me long—I have a great deal to do.

A. Ah, so much the better; it is a sign of good business. Well, sir, I am forty-five years old. I have been in the wine trade, the coal trade, the piano trade, the commission agency business, and latterly I have travelled in lubricating oils.

P. I am much obliged to you for your confidence, but really——

A. Well, none of these things have prospered, and now, at forty-five years of age, I see myself compelled to seek something else.

P. It's very sad; but you must excuse me——

A. I will not detain you five minutes. Now, I'm going to make a confession to you. I'm afraid I'm rather lazy.

P. Possibly; but I cannot see what your laziness has to do with me.

A. I will tell you. After failing so many times, I said to myself, "Since you are so lazy, there is nothing left you but photography." I recollect five and twenty years ago that acrobats, showmen—anybody, in fact—went into photography and made fortunes. It seems to me it is very easy, and does not want any capital.

P. You are mistaken. I can assure you that——

A. I know what you would say, but no one praises his own profession. And quite right to try and keeps others out. Now what I want to ask you is whether you will consent to take me as your assistant, so that I can learn photography?

P. You want to learn photography?

A. Yes.

P. Because you are lazy?

A. Certainly. Of course I do not ask you to pay me.

P. You are too good. Allow me to say that I do not want an assistant; that to learn photography now-a-days one must pay a qualified teacher; that no business demands more energy; and that there are few where capital is more required.

A. You surprise me; I——

P. Pardon me for bringing this conversation to a close, I have an appointment at this hour. Good morning.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter II.—History of Photography (*continued*)—Action of Light—Compounds and Elements—Symbols and Formulæ—Atomic Weights—Compounds—Mixtures—Emulsions—Solutions—Precipitation.

1840. John Herschel used the terms "positive" and "negative" as they are now understood photographically, "to avoid circumlocution." He used glass plates to receive and support the deposit of sensitive silver compound.

—— Bromine was introduced for photographic purposes, as applied to the preparation of the Daguerreotype plate by Goddard, and in other ways by Bayard.

1841. Petzval invented the lens that bears his name, and Voigtländer constructed it.

—— Fox Talbot patented his calotype process, in which iodide of silver was used on paper, and great sensitiveness was got by means of a solution of gallic acid with nitrate of silver, and the scarcely visible image produced by exposure was developed with more of the same solution. One minute's exposure with an aperture of $\frac{f}{13}$ was sufficient for a building in sunshine.

—— Claudet patents the use of coloured media, preferably red, through which the "dark room," which was till then really dark, was illuminated.

1842. John Herschel described methods of printing with iron salts, including the production of prints in Prussian blue.

1844. Robert Hunt introduced ferrous sulphate as a developing agent.

1848. Nièpce de St. Victor introduced the albumen process, in which glass is coated with albumen that contains iodide of potassium, and the film is sensitized by dipping it into a solution of nitrate of silver (the silver bath).

1851. F. Scott Archer introduced collodion, which was first suggested for photographic purposes by Le Grey.

1852. Fox Talbot described photo-etched plates, prepared by coating the plate (or lithographers' stone) with a mixture of gelatine and bichromate of potash, exposing in a printing frame, washing, and etching.

1854. The *Art Journal* gave an impression from a woodcut, engraved from a photographic impression on the wood. In 1858, the Photographic News also gave a specimen.

1864. Bolton and Sayce used collodion emulsions.

1871. R. L. Maddox used gelatine instead of collodion.

On looking over this meagre sketch of the history of our subject, we see that the art of photography is not yet fifty years old, and that 1839 was the most important year of its development. The publishing of Daguerre's process at that time was a powerful incentive to other workers, especially Fox Talbot, to complete and to bring forward the results of their investigations; and we may safely say that if Daguerre had never employed himself with this subject, the world would not have had to wait much longer for the advantages of photography. The fruit of the labour of many previous workers was fast ripening, and it was almost by accident that Daguerre happened to find it fully ripe before any of his co-temporary workers; but to him must ever belong the glory of having first made photography usefully possible.

Photography is little more than a practical application of the chemical action of light. We do not know what light is, but we do know in many cases the effects that it produces. We know also that sunlight is not homogeneous, but that it may be separated into lights of different colours, as in the rainbow. Therefore, in speaking of "light" without further qualification, the word is used in its commonly accepted sense, and generally refers to the light that reaches us from the sun.

The chemical action of light is universally known, though perhaps not often recognized as such. The house-wife keeps her blinds drawn down to prevent the fading of the curtains and carpet; and the bleaching action of light was usefully applied before chlorine compounds were used in the preparation of cotton fabrics. Shortly before the Christian era, Pliny observed that yellow wax lost its colour by exposure to light. The destruction of colour, however, is not characteristic of the chemical action of light, for we have already noticed how that chloride of silver is darkened by exposure, and the green colouring matter of plants, the chlorophyl, is not produced in the roots which are below ground, nor in the plant at all if it is grown in the dark. Light causes the separation of chlorine from its compound with silver, but it causes chlorine to combine explosively with hydrogen if the two gases are mixed and placed in the sunshine. Hence, we must not imagine that light is especially either a destroyer or a builder up of compounds, any more than heat or any other force is; its action depends upon the circumstances of the case. Chemical action produces light and heat, as we see in our lamps and fireplaces; and reciprocally light and heat produce chemical action.

Let us proceed to see what this chemical action is so far as it concerns us, before we engage in the study of practical optics.

All things that we deal with must be either compounds, or elements. Every compound can be either decomposed—that is, pulled to pieces—or can be built up from its constituents; but the elements cannot be decomposed. For example, if we were to make the dry crystals of chloride of gold red hot, this compound would be decomposed, that is, the gold and the chlorine would separate from one another; but we may do whatever we please to a piece of iodine, or of silver, we cannot by any known means get anything whatever but iodine from the iodine, or silver from the silver. They may be ground up, melted, volatilized, but the iodine always remains iodine, and the silver is always silver.

An element, therefore, cannot suffer chemical change, whenever it enters into a chemical action, it can only combine with something else. When a silver plate is sensitized for the production of a Daguerreotype, it is exposed to the vapour of iodine, and the sensitive film is produced by the combination of the silver and the iodine. In this case two elements combine to form a compound. There are circumstances, however, that sometimes make it not advisable to use the simple element when we want to get a compound containing it. If an over-dense negative is to be reduced, we may desire to change a part of the silver image into chloride of silver, that hyposulphite of soda may dissolve it away; and this change could be produced by applying the element chlorine. But chlorine acts very vigorously in combining with other things, and would probably spoil the negative. The silver, moreover, can very readily take chlorine from the compound of chlorine with iron, called ferric chloride or perchloride of iron, leaving the iron with less chlorine; and as this compound is very much less likely to injure the negative, it is a preferable reagent to the simple chlorine. An element will often form a compound by taking what it combines with, out of a compound.

Compounds invariably have very different properties from the elements they are composed of; sulphate of iron, for instance, contains the tough metal iron, the yellow sulphur, and gaseous oxygen, but the compound is not tough, nor yellow, or gaseous. Pyrogallic acid is a compound of carbon, oxygen, and hydrogen; and although each of these elements can be easily got out of it, so long as they remain joined together their individual characters are entirely lost—the compound bears no resemblance whatever to either of its constituents.

There are nearly seventy elements known, but only about twenty of these are of sufficient importance to the photographer to make it worth while to introduce them into this short sketch of photographic chemistry. It is the custom of chemists to indicate the elements by their initial letters, or by the initial letters of their Latin names, sometimes adding a second letter to avoid confusion. And these "symbols" do not stand merely for the elements, but for a definite proportion by weight of each; for example, the two symbols which together constitute the "formula" of hydrochloric acid, HCl, indicate not only that the compound consists of hydrogen and chlorine, but also, that it consists of these elments in the proportion of one part by weight of hydrogen to 35·5 parts by weight of chlorine.

The proportional weights assigned to the elements are termed the "atomic weights;" that is, the proportional weights of the atoms; and the symbols are taken as standing for the atoms. This part of chemical theory has a far deeper significance than it is necessary or desirable for us to inquire into just now.

The following table gives the names of the elements that are most important photographically, with their symbols and atomic weights:—

Non-Metals.			Metals.		
Name.	Symbol.	Atomic Weight.	Name.	Symbol.	Atomic Weight.
Hydrogen	H	1	Potassium	K	39
Chlorine	Cl	35.5	Sodium	Na	23
Bromine	Br	80	Ammonium*	Am	18
Iodine	I	127	Silver	Ag	108
Oxygen	O	16	Calcium	Ca	40
Sulphur	S	32	Lead	Pb	207
Nitrogen	N	14	Copper	Cu	63·5
Carbon	C	12	Iron	Fe	56
			Mercury	Hg	200
			Gold	Au	196
			Platinum	Pt	195

All compounds have a definite composition which can be expressed generally by a very simple formula. Thus table salt or chloride of sodium is expressed as $NaCl$, and this formula, in conjunction with the above table, shows at once that this substance contains 23 parts by weight of sodium to 35·5 parts by weight of chlorine. Corrosive sublimate, which is written $HgCl$, contains 200 parts by weight of mercury, combined with twice 35·5 (that is 71) parts by weight of chlorine. The proportions of the constituents of compounds do not vary, but commercial preparations vary by being mixed with more or less of foreign matter which may have been not entirely removed in the manufacture, or which may have been produced by the decomposition or change of a part of the preparation.

Mixtures, however, are totally different from compounds. Sugar and salt may be ground up together in any proportions whatever. Two or more gases, such as nitrogen and oxygen, can be mixed in any proportions, and the same often applies to liquids, such as water and alcohol. But when it is desired to mix a solid with a liquid, there are difficulties that have to be overcome. Sand will hardly mix with water, it soon settles down; but fine mud will remain in suspension for a considerable time. It is possible to get gold in such a fine state of division that it will not settle down from the water it hangs in for years.

An "emulsion" consists of a liquid holding a solid of such a degree of fineness suspended in it, that the ordinary methods of separating solids from liquids are almost ineffectual. Ordinary filtering media allow emulsions to pass through them, and the solid matter subsides very slowly.

However fine the particles of an emulsion are, they can be separated from the medium that holds them, and they are still solid; but when a solid is dissolved in a liquid, the most refined methods of filtration entirely fail to effect a separation. A dissolved compound is not chemically combined with its solvent, for the proportions of the two may be varied within certain limits; but the union is something closer than that of a mere mixture. The dissolved substance may generally be recovered by evaporating away the solvent, or by changing the solvent in such a way as to rob it of its dissolving power. Collodion, for instance, is a solution of what is called soluble gun-cotton in a mixture of alcohol and ether; and the gun-cotton may be recovered in the solid condition either by evaporating off the alcohol and ether, or by adding water, because alcohol and ether mixed with sufficient water cannot dissolve the gun-cotton.

It is often desired to obtain one constituent of dissolved matter in a solid form, the nature of the solid being quite a secondary matter, so long as it contains the particular constituent; for example, the silver in waste solutions. In such cases it is convenient to "precipitate" what is wanted by adding something that will make an insoluble compound with it, as for silver, the sulphide of sodium, which produces the black insoluble sulphide of silver.

Notes.

The recent severe weather has played sad havoc with photographic studios. Where glass has not been absolutely broken, the snow, in a melted condition, has penetrated, and studios have become the most uncomfortable places which can well be imagined. In some cases great damage has been done, and one suburban photographer, whose studio is below the sloping roof of an adjoining house, tells of fifteen squares of glass broken by half-frozen snow slipping from his neighbour's premises. Neither does it appear that he has any claim for compensation, as the studio was built a long time after the house. But if such had not been the case, it is doubtful whether the neighbour would be liable for the damage, unless it were shown that he had been guilty of wilful neglect.

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* As ammonium consists of two elements, nitrogen and hydrogen (NH_4), it is neither an element nor a metal, but it is convenient to include it, because it behaves like a metal.

The reports which have reached us of damage done to studio roofs suggests the question whether photographers would not be wise in reducing the vast area of glass which belonged to the collodion period. Many men who have convinced themselves of the advantage of working with a limited supply of top light, yet hesitate to cover in their roofs permanently, lest at some time or another they should require the light so blocked out. But these occasions are very rare, and, putting one advantage against another, the comfort of working in a dry studio outweighs whatever power may be gained at rare intervals through using a large expanse of glass roof. It would be a question well worth consideration what modifications in the present form of studio dry plate work has rendered possible.

The permanency of platinotype prints has been rather loudly asserted by those commercialists who control their production, and until quite recently the contrary view has, as far as we know, been mainly upheld by the late Dr. Monckhoven. Recently, one of the traders in the process having, with singular vehemence, asserted the permanency of platinotypes as against such sulphur compounds as may occur in the atmosphere, it occurred to Andrew Pringle to try the experiment, and he found that sulphuretted hydrogen rapidly yellows platinotype prints. Pringle describes his experiments in last week's *British Journal of Photography*.

Photographs by moonlight are no novelty; their interest consists in their degree of excellence. *La Nature* gives in its current number four reproductions from moonlight negatives, two of which reproductions, if they are faithful representations, are certainly remarkable. The print is a *fac simile* of a photograph taken in September 14th last year, at Royat, by M. J. Jackson, the librarian of the *Société de Geographie*. The scene is a landscape, and the foliage is but indistinctly rendered. The most pronounced charactertic is the track of the moon, which makes a straight band of light nearly half way across the picture. No. 2 is the *fac simile* of a photograph of a house in Paris. It possesses no remarkable features. No. 3 is far more successful. It represents a scene on the Rhone, both the landscape and the bridges with their lights being well reproduced. The duration of exposure was in this, as in the two others, an hour. No. 4 is an instantaneous moonlight photograph. It was taken by M. Barral, and represents the firework display at Lyons on the 14th July, 1886. Unquestionably, if the picture in *La Nature* really is, as it purports to be, a *fac simile* of the photograph, moonlight photography has made one enormous advance. But *La Nature* has only given wood cuts; what one would like to see would be prints from the negatives.

How can one measure the relative density of the various parts of the negative? Abney answered this question at Pall Mall on Tuesday last.

The negative is placed in a magic lantern, and a rod is placed so as to cast a shadow on that portion of the screen corresponding to one density of the negative to be measured. A beam of light is now taken from the side or back of the lantern, and reflected upon the screen so as to cast a second shadow of the rod, and in the path of this reflected beam is placed the mechanical equivalent of a graduated and adjustable diaphragm. By the opening or closing of this mechanical equivalent of an adjustable diaphragm, the two shadows of the rod can be made equal, and when this is the case the intensity of the light reaching the screen through the part of the negative under operation will be equal to the intensity of the light reaching the screen by way of the reflector and adjustable diaphragm.

If this balance is struck on each degree of density in the negative, the index of the adjustable diaphragm will register numbers corresponding among themselves to the degrees of density of the negative to be measured.

A lecture on photographic lenses, by J. Traill Taylor, will be given at the rooms of the Society of Arts, John Street, Adelphi, on Wednesday, the 26th inst., at 8 p.m. Although admission is through the introduction of a member of the Society, we imagine that no person interested in the subject will have any difficulty in gaining admission.

There is probably no amateur actor strong-minded enough to resist the temptation of being photographed when attired and made up for acting his favourite character. So, too, it requires a quantity of self-denial rarely possessed by the supporters of fancy-dress balls to return their hired apparel to the theatrical costumiers without first securing a photographic record of their appearance in their "war-paint." Thus it is, then, that at this season of the year the photographer is accustomed to the drawing up of growlers at his portals, and to the hurried invasion of his studio by mysteriously muffled-up figures, whose Ulsters or rug-paletots, on being removed, reveal to sight, it may be, the inky trappings of some Brixton or Upper Tooting "Hamlet," or the more brilliant garb of "a Courtier of Louis XIV.'s time," or a "Venetian Nobleman of the 16th century." Some districts develop customs of this kind in exceptional profusion; and if rumour be worthy of credence, there is at least one London photographer whose studio is to found in close proximity to a transpontine "Literary Institute" much given to the encouragement of amateur acting of a serious class, who has found it advisable to add a first-class "Yorick's skull" to his stock of artistic properties for the use of the incipient Irvings and embryo Kembles of the neighbourhood. Need we say that it is in quite another part of the metropolis, and quite another sort of photographer, who, with an instinctive knowledge of his patron's taste, has purchased a second-hand prize belt once worn by a famous local pugilist, and allows his customers to be photographed wearing the same on the payment of an additional fee of twopence, and which is only another proof of the oft-repeated statement that tastes differ.

To adapt photography to blackmailing purposes would not seem to be a very easy thing. It has, however, been accomplished by an individual at Bolton, who, coming across a vendor of photographs, pounced upon a number of portraits of popular actresses, told the astonished dealer that he was a detective, and impounded the photographs as "indecent." Shortly after he returned and offered to square the matter for five shillings, thereby arousing the suspicion of the vendor. A person who was supposed to be the culprit was brought up for trial, but succeeded in establishing an alibi, and the jury acquitted him.

A correspondent of the *English Mechanic* has raised a question of law interesting to photographers. He bought some dry plates for lantern slides of a dealer, and as they turned out badly, he took them back to the dealer, and demanded the refunding of the money. This the dealer flatly refused, contending that the manufacturers of the plates were the persons liable. The purchaser thought otherwise, because he had paid the money to the dealer; but as the dealer held to his opinion the matter is at a deadlock, and the purchaser now wants to know how the law stands.

Unquestionably, as the Lord Chancellor in Mr. Gilbert's "Iolanthe" says, "it is a nice point." But does not the common sense of the matter suggest that as no guarantee was given, the purchaser cannot recover? To be on the safe side, a customer must demand a "written warranty," as in the case of a horse. But whether either a dealer or a manufacturer would give such a guarantee is another matter. Dry plates, from their inherent nature, must be taken with all their faults. Even when one plate out of a packet is tested and found faulty, a manufacturer would possibly refuse to exchange, because he might say, "Yes, I admit the plates are defective, but they were quite right when they left my hands. How do I know what you have done to them?" In the instance quoted, the complainant expressed his belief that the dealer had kept the plates in a damp place, but he had no proof of this. Who is to decide when one man's word is pitted against another's? The only guarantee of excellence in dry plates is the reputation of the maker, and the respectability of the dealer. If customers begin to lose faith in either the one or the other, the sale of this particular make must instantly go down. For this reason photographers as a community have a protection, but as individuals may suffer, as in the case under discussion. For these individual cases it is difficult to suggest a remedy.

CHEMICAL THEORY IN ITS PRACTICAL BEARINGS ON PHOTOGRAPHY.

BY RALPH W. ROBINSON.

III.—Negative Processes—Emulsions.

Having now a general understanding of the main ideas of chemical theory, we shall proceed to examine how they are practically applied in photography.

We shall first consider the chemistry involved in producing a negative, tracing all the reactions which take place, from making the emulsion, to the perfection of the finished negative. Two negative processes are of sufficient importance in modern photography to claim our special attention—the gelatino-bromide, and the wet collodion processes, other than these being but seldom employed. The former, being by far the more generally used, first demands our notice.

As is known to every photographer, the emulsion is made by mixing in the proper manner certain proportions of gelatine, silver nitrate, and potassium bromide, and thoroughly washing the resulting body. Sometimes also a small proportion of potassium iodide is added with the bromide. The proportion of gelatine used has no effect on the chemistry of the process, and it is that which has been found by experience to give the best results. The ratio of silver nitrate to potassium bromide and iodide, however, is an important matter. When potassium bromide is added to silver nitrate, silver and potassium change places, and a reaction takes place which is represented by the equation—

$$\underset{\text{Silver Nitrate}}{AgNO_3} + \underset{\text{Potassium Bromide}}{KBr} = \underset{\text{Silver Bromide}}{AgBr} + \underset{\text{Potassium Nitrate}}{KNO_3}$$

With potassium iodide and silver nitrate the reaction is similar, and the equation is identical, except that the symbol for iodine, I, must be substituted for Br, that of bromine.

Having now arrived at the equation for the reaction, we can proceed to calculation. We will take a standard formula for a gelatine emulsion, and explain why it is as it is.

The following is given by Captain Abney in his "Instruction in Photography":—

Potassium iodide	5 grs.
Potassium bromide	135 ,,
Silver nitrate	175 ,,
Gelatine	270 ,,

The atomic weight of silver (Ag) is 108, of nitrogen (N) 14, of oxygen (O) 16, of potassium (K) 39, of bromine (Br) 80, and of iodine (I) 127

The equation then shows that $(108+14+48)=170$ grs. (or ozs., lbs., &c., as the case may be) of silver nitrate mixed with $(39+80)=119$ grs. (or ozs., &c.,) of potassium bromide yield silver bromide, and potassium nitrate with no excess either of potassium bromide or silver nitrate. Substituting I for Br in the equation, we find $(39+127) =166$ grs. potassium iodide are required to convert 170 grs. of silver nitrate into silver iodide without excess of either; for practical purposes we may say, then, that the 5 grs. of potassium iodide of the standard formula use up—so to speak—5 grs. of silver nitrate. We thus see that 119 grs. of bromide and 5 grs. of iodide are sufficient to account for the conversion of the whole of the 175 grs. of silver nitrate of the formula, the remaining 16 grs. of potassium bromide being used for reasons which will appear below. The subsequent process of washing the emulsion serves to remove the soluble potassium nitrate formed by the reaction and the excess of potassium bromide.

Other haloids than the potassium salts are sometimes used in making an emulsion. For instance, for potassium bromide, ammonium bromide might be substituted. Then the question would arise, what weight of the latter is equivalent to 135 grs. potassium bromide. Substituting ammonium bromide for potassium bromide in the equation, it becomes

$$AgNO_3+NH_4Br=AgBr+NH_4NO_3$$

$(14+4+80)=98$ grs. ammonium bromide, these are equivalent to 119 grs. potassium bromide. So by the proportion

$$119:98=135:111\cdot18$$

we find that 111·18 grs. of ammonium bromide are required instead of 135 grs. of the potassium salt. The calculation for other bromides would, of course, be similar. First ascertain the correct equation for the reaction. This will show how much of the salt is required for 175 grs. silver nitrate, the equivalent of 119 grs. potassium bromide. Thus a simple proportion gives the answer required.

There are now two other points in the chemistry of gelatine emulsion making which require explanation.

In preparing the emulsion by the formula given, a small quantity of alcoholic solution of iodine is added to the solution of potassium bromide before mixing with gelatine and nitrate of silver, and, as appeared above, an excess of bromide and iodide over the silver nitrate is used. Potassium iodide in the presence of moist air (and there is *always* moisture in the atmosphere) and light soon becomes alkaline, this reaction taking place—

$$2KI + \underset{\text{Water}}{H_2O} + O = 2I + \underset{\substack{\text{Potassium}\\\text{Hydrate}}}{2KHO}$$

Part of the iodine liberated volatilizes, and if some means were not taken to destroy this potassium hydrate. it would act on the silver nitrate, forming silver oxide, and this on development would produce fog.

$$2KHO + 2AgNO_3 = \underset{\text{Silver Oxide.}}{Ag_2O} + 2KNO_3 + H_3O$$

If iodine is added to potassium iodine which has thus become impure, this reaction takes place—

$$6I + 6KHO = 5KI + \underbrace{KIO_3 + {}_3H_2O}_{\text{Potassium Iodate.}}$$

Potassium iodate is soluble, and is removed by its subsequent washing.

The reason for using an excess of bromide and iodide is this. If the haloids are in excess, pure silver bromide and iodide are first precipitated, and soluble impurities which they are liable to contain do not form fog-producing compounds with the silver, but are washed out of the emulsion.

The chemistry of the wet plate emulsion is very much the same as that of the gelatino-bromide. The plate is coated with collodion containing soluble bromides and iodides, and iodine. It is then dipped in the silver nitrate bath, which is acidified with nitric acid. Silver bromide and iodide are precipitated in the film. The only question which occurs now is, why acidify with nitric acid? Besides other impurities whose presence is possible in a collodion which has been kept mixed any length of time, aldehyde is apt to be formed. In a neutral solution this would reduce silver nitrate to the metallic state and produce fog, but in the presence of nitric acid this is impossible.

PHOTO-MICROGRAPHY.

BY F. H. EVANS.*

The comparative barrenness of my apparatus as exhibited here before you will serve to emphasise the fact that simplicity is the main characteristic of my method of producing the negatives from which George Smith has produced the slides shown on the screen this evening. You will see that all I have here is an ordinary microscope, of first-class quality, with a full supply of all essential accessories: the ordinary lamp with its condenser, and a quarter-plate landscape camera. The wooden framework upon which these are placed when in use I have not brought, it being so cumbersome; it is perfectly plain and simple, and high enough when placed on a table to bring all working parts of microscope and camera to sight height, thus avoiding the fatigue of a continual stooping position. I find this work quite fatiguing enough in itself to insist upon all its arrangements being as convenient as possible. The top of this framework is grooved, so that the lamp, microscope, and box on which camera works, to bring it level with eye-piece of microscope, are all centred to each other when properly arranged. The camera box is also grooved. As some of my exposures have been as long as three hours, all chance of accidental shifting of arrangements had to be thus brought to a minimum.

I was first led to the study of microscopy, and also of photography, by my life-long love and study of "the beautiful." Scientific research was in no way within my means; though having fairly conquered some of the more difficult aspects of the "beautiful" side of photo-micrography, I am hoping to do far better things in the more valuable and difficult fields of pathology, histology, and the like.

A chief element of my success has been the very great care I have always bestowed on the variety and quality of illumination, more especially in the difficult and comparatively unworked fields of dark ground illumination, *e.g.*, reflected light, spot lens, paraboloid, &c. I was the more desirous of succeeding here, as I found any hope of success equal to that obtained by the ordinary "transmitted" light was discouraged by such authorities and writers on this subject as I had been able to consult; also, from the fact that the best of my objects, those most worthy of being photographed, were best shown by one or other of these systems of illumination.

The microscope is first brought to a horizontal position, the lamp lit, and its condenser adjusted, object placed securely on the stage, object glass selected, and the lighting then obtained as perfectly as may be possible, this essential part of the work being fully settled before camera is attached to the microscope. I frequently have to spend over half-an-hour before being satisfied that the lighting is at its ideal best; for though a lighting quite sufficient for ordinary observation may be very much more quickly obtained, for photographic purposes it is absolutely essential that the illumination be of equal intensity all over the field. Those of you who have worked much with the spot lens, for instance, will know how difficult and tedious a matter it is to secure an equally lit field all over, especially under low powers, such as 3-inch, 2-inch, or 1½-inch objectives. Reflected light on opaque objects is as difficult, the lamp being necessarily so much on one side, the strong shadows are not easily modified into artistic balance. Fully as much attention is necessary in this work as in landscape or portrait photography, to achieve artistic gradation, chiaroscuro, shadows, and high lights properly contrasted and blended. The two slides of shells, "No. 4, Polycistina, grouped," and "No. 123, Quinqueloclulina excavata," are good examples of this, as also "No. 67, Eye of Dytiscus," which seems to my partial fancy as fine an example of artistic photography—perfectly pure and untouched—as can be desired; at least, in photo-micrography. The lighting of "No. 40, Polycistina grouped," was more difficult still, these being taken by the closer working 1-inch O.G., the others by lower powers. The "Eye" was taken by the ½-inch O.G., under, of course, transmitted light. In "No. 143, Section of Lapageria rosea," I was delighted at securing what I hardly hoped for, the real lustre and silkiness of the object itself, as seen under the microscope by spot lens. I think you will allow that this and the beautiful star-shaped "Section of Echium Spine, No. 2," are exceptionally faithful representations of dark ground illumination effect.

In transmitted lighting it is often very difficult, especially under low powers, to get a field well lit of equal intensity all over; also to avoid or modify interference lines. I find a piece of finely ground glass very serviceable here, working in a tube in the sub-stage. I frequently place the lamp near the stage, and use the mirror when I want delicate effects of lighting, obtainable only by oblique light; to secure, for instance, the better rendering of surface detail without losing the details given by the light *through* the object. Examples of this will be found in "No. 127, Manje insect of the Horse," and "No. 70, Spiracle of Dytiscus."

Illumination being now settled, the camera is attached by this cloth junction, and made light-tight by a couple of rubber bands. I have in all cases retained the "A" eye-piece, preferring to do so for the greater control over and comfort in focussing, &c. Practically I have ignored the question of the difference between the visual and the chemical foci; and though these slides are by no means put forward as the perfection of minute definition in some one plane, still, the more important element of adequate pictorial definition, characteristic and natural representation of the object, has, I venture to think, been fully attained. As a good case in point, I would direct special attention to the slide No. 82, the very difficult diatom, "Nehopelta metii."

After adjusting the camera until the image fills the desired position in the $2\frac{3}{4}$-inch circle on the focussing screen, this glass is removed and replaced by one specially devised for *fine* focussing in conjunction with a focussing eye-piece. This glass is a piece of patent plate ruled on its inside surface (when in the camera) with microscopic lines to the pattern you will observe. I am indebted to George Smith for this idea, and the ruling of the glass. The focussing eye-piece is placed in contact with the plain ruled surface of this ruled glass, and adjusted till it focusses the lines quite sharply; this focus is then made rigid. The image being now received on this glass through the focussing eye-piece (invisible, of course, without) is now, in the plane before chosen as that which will best represent the object, focussed as sharply as possible by the fine focussing wheel of the microscope, the ruled lines filling the eye simultaneously with the image, and both being sharp *together*. The late Dr. Woodward had a somewhat similar plan, but lacking, as I think, the essential value of Mr. Smith's. Dr. Woodward's was simply a piece of plain glass, his focussing eye-piece being focussed for the inside surface (when in the camera). But what certainty is there that the eye, with its adaptive power of focussing, will stay *unaided* at that plane? I found that scratches, or any extra fine surface, or even ruled lines *fully* covering the glass, were not sufficient; the eye had still power to leave them, and focus the image on another plane than that of the glass surface. Mr. Smith then suggested the ruling the glass to a definite pattern. This more fully fills and holds the eye in the desired plane, while focussing with the fine adjustment of the microscope, than any other plan I have tried, and to its use I gladly attribute much of my success in focussing.

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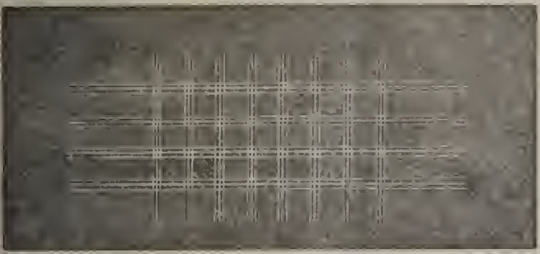
* Read before the Photographic Society of Great Britian.



All ultimate success, however, depends altogether on that uncertain quantity, the judgment, as employed in selecting the plane of the object which, when focussed for, shall give the best general representation of the object. No object is so flat as to render possible a focus absolutely sharp all over. In the matter of focussing, it is in this work as in all other photographic work. All artistic success and value in the final picture depend upon the successful selection of the right plane; in landscape work before any "stopping down" is resorted to. It is a pity that this "stopping down" cannot be used here with like success. It may be used in some cases to a limited degree; but great care is required that the optical performance of the lens be not upset, the change of stop always marring the definition to some degree. But, whatever means be devised, the problem will still always present itself: which plane is the best to choose to gain the best general and most characteristic representation? the solution being found only in personal intelligence, study, and experience. A carefully kept, exhaustive note-book of all the conditions under which each exposure is made is an essential to any success beyond the accidental; the aim must be to be able to repeat any genuine success by knowing why and how it was gained in every particular.

Exposure I can say little helpful about, there being so many factors known only to the worker. Repeated trials, under identical conditions, form the only "royal road" to success in this direction. I have given everything, from three seconds to three hours. The great thing to know is when the best possible exposure has been given. Contrasted with ordinary photography, this work has been of great value in showing me the relative value of varying exposures, for I have rarely been content with one exposure of any object—some, indeed, having absorbed a dozen plates and more before I was satisfied; but it is, at least, infrequent that the opportunity occurs to study any landscape work in this way.

One of my initial difficulties was in obtaining a quarter-plate camera that should serve me alike for this work and for landscape work. I wanted an exceptionally long range of focus, so that in field work I might be able to use what I thoroughly believe in: a good stock of lenses, and at the microscope to get the due amount of magnification. As my aim is only to make pictures, this large stock of lenses (nine available foci, and one mount only) is essential to the securing whatever artistic result is desirable and possible. No quarter-plate camera that I could hear of gave, for instance, range of focus sufficient for a 12-inch lens; and it was not until after much searching that I found it in Mr. Smith's "sciopticon" camera, this being the beginning of my acquaintance with Mr. Smith—an acquaintance which, I am glad to say, has ripened into a very enjoyable friendship. I had this 4¼ by 3¼ camera from him over three years ago. It has a range of focus of from 3 to 12½ inches, and what I most wanted in my micro work, a level base-board from end to end, even when fully extended; it folds up to 2½ inches, is very light and rigid, and its only loose part is the focussing screen, which to me is an advantage, using, as I do, the two kinds for coarse and fine focussing. I much prefer the use of a second glass to having the usual ground glass, with a central spot, plain, for fine focussing.

With reference to the slide shown on the screen, I should like to say this: that though I can produce a decent lantern slide by the ordinary methods from a landscape or other negative, I continually failed to get any result worth keeping when attempting a slide from my micro-negatives. This was especially the case in those negatives from dark ground illumination effects; by the time fine detail was secured, the background was opaque, and rendered the whole hard and unsatisfactory; the transparence, gradation, and delicacy, so conspicuous in the Woodbury slides, was here conspicuous only by its absence. There must be some inherent virtue in the Woodbury process that gives effect not obtainable by ordinary photography, such as contact printing. Most landscape negatives require some "dodging" by tissue paper on the back and pencil working thereon, in order to gain the best possible print; but in the case of my landscape negatives so treated, Mr. Smith has invariably removed all such preparation, and from the perfectly plain negative got far better results.

I have brought a few typical negatives with me for your inspection, and from them you will see that there are no qualities in the slides not directly traceable to the negatives as you now see them.

The object shown under the microscope is a very fine specimen of young star-fish—ophiscoma rosula—small enough for the whole to be included in a perfect condition in the ordinary micro-mount. It is shown by the spot lens, and will be interesting to compare with its photograph, slide No. 13.

As the object is a very deep one, and the negative was obtained with the micsoscope in its present condition, you will be able to estimate the relative value of the pictorial definition secured.

TRANSPARENCIES FOR THE OPTICAL LANTERN BY THE WOODBURY PROCESS.

BY G. SMITH.*

My principal object in coming before you this evening is to disclaim, more than to claim, any special merit with respect to these slides, for in the words of our opening address to the Royal Microscopical Society we said:—

"These slides are intended specially for educational purposes, to help the optical lantern to fulfil its manifest destiny as the great educational instrument of the future. They are not put forward as perfection, but as an earnest effort towards the limit of perfection attainable by human skill. The measure of success already reached is controlled to a great extent by the inherent imperfection of even the most skilfully constructed lenses. But while the definition is possibly less perfect than may be considered desirable, it is certainly not inferior to that attainable by any ordinary high-class microscope; while, if the degree of magnification be taken into account, it is probable that it is not likely to be greatly surpassed."

The slides have had the good fortune to be esteemed worthy of the medal of this Society; and it is more especially to the share of my colleague, Mr. Fred H. Evans, in that honour that I wish to draw your attention.

As a matter of fact, their title in your Exhibition Catalogue—scientific slides—is almost a misnomer. If that had been their real object, they would in all probability never have been produced. They were, on the part of Mr. Evans, simply artistic studies in the fullest sense; and, on my part, an earnest endeavour to raise the position of photography to that of a true art—a position which I believe it to be fast losing, as evidenced by the dangerous prominence given by the Photographic News to the so-called art of retouching.

The specimens of artistic photography, as I venture to call them, which I shall show you this evening, are so called because they are absolutely untouched. They will include some of the most common-place objects and grimy scenes, and owe all their artistic value not so much to the beauty of the object, as to the selection of point of view and the accurate rendering of the light and shade. If, therefore, they appear to stand out in stereoscopic relief upon the screen, it is only because the light and shade are accurately rendered. This alone confers upon them the right to be considered artistic; and, being done by pure photography seems to me to be incontrovertible evidence that photography may reach the position of a true art. The greater number, of course, will be microscopic subjects, the extraordinary beauty of which is, primarily, entirely due to the great skill of Mr. Evans in this particular branch. But I shall show a few others to emphasise the principle revolved in their production.

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* Read before the Photographic Society of Great Britain.

I will return to this part of the subject later on, and proceed at once to the method of printing, It is hardly necessary to describe the Woodbury process to this Society. The usual pellicle of gelatine made sensitive with bichromate of potash was exposed to light behind each negative; the soluble gelatine unacted on by light washed away; the remaining insoluble relief pressed, by hydraulic pressure, into the lead forming the mould, from which the casts, or prints, in a pigmented solution of gelatine, are in fact the slides before you.

As, however, the permanence of all photographic pictures is important, it is necessary that I should say a few words as to the probability of their permanence. I produce one which was exposed to light for many years in a show frame; the red all faded out of it long ago, but the black remains. It was also exposed to great extremes of moisture from the every-night condensation on the window, the paper binding having completely perished from that cause; but the gelatine film is uninjured, though unprotected except by the cover-glass. I was, however, quite prepared to hear that fungi attacked the unprotected film in Burmah, for I have seen many such in this country. It will therefore perhaps interest you to know that a coating of plain collodion will not only protect the slide from any such attack, but go a long way towards the perfect restoration of those already badly diseased, leaving hardly any visible trace. As a matter of fact, also, every slide that I have issued since 1879, when the business came into my hands, has been so, or similarly treated. I may as well mention here that I have found this same plain collodion the best of all varnishes for gelatine negatives, its tenacity being remarkable when of the suitable horny kind. The negative I produce so protected was left out of doors and forgotten during the many winter months of the winter 1884-5, with the bichromated gelatine too, in one of the commonest of printing frames, buried in the snow for days together, and is practically uninjured.

Still I have not trusted alone to varnishing. For the last two years all my slides have been provided with a gelatine which would appear to be practically imperishable, the addition of bichloride of mercury completely protecting it; at any rate, under the more unfavourable condition of being swollen with moisture, from all mildew or other signs of decomposition. The only pigment employed is pure lamp-black collected from the tip of a benzoline flame, which gives the superb brown you now see.

Mr. Evans will tell you of the happy chance which resulted in our meeting, but he probably will not tell you what our real difficulties were in carrying out his projects, or how we surmounted them. The object in view was to secure photographs which should be faithful reproductions of what he saw in the microscope. This necessitates the greatest nicety of illumination, of which you must allow he has shown himself a master. It necessitated the use of the ordinary microscope appliances, and the photographing of the objects through the eye-piece, and consequently a great variety of objections. Subjected to this crucial test, their performances varied sufficiently to cause some difference in the value of the results, but it was decided to go on, aiming at pictorial quality rather than microscopic definition.

The principal difficulty, however, was in obtaining negatives suitable for my purposes, for I am pleased to see that it is at last recognized that process has a good deal to do with the type of negative that should be considered good. What is generally considered as a fair-printing negative is my ideal of the worst possible type, viz., one that is many times over-exposed, and supposed to have been saved by development. We gave that an exhaustive trial, having full faith in bromide and ammonia, combined with brains. But our brains failed us utterly here, and would have abandoned us altogether if we had not abandoned bromide and ammonia for a fairly reliable normal developer, and been guided by exposure alone.

A distinctly acid, fully saturated ferrous oxalate developer is the most powerful and rapid developer I am acquainted with—too rapid for comfort in most cases, yet with it to obtain a perfect negative of one subject may require prolonged development; while another, to be equally perfect, would be developed in less than a minute. I illustrate this by producing one of Mr. Evans' earlier negatives, which, being far too feeble for my purpose, I took the trouble to reproduce. The positive was made on one of Ramsden's slow bromide plates, made specially for me for the purpose, without exposure to light during manufacture, and the one now shown was the result of one second's exposure to a lamp flame, and six hours' development in the strongest ferrous oxalate developer many times renewed. I was so fascinated with this that I reproduced many more, every succeeding exposure proving more and more fully that exposure is everything, developer quite secondary.

I cannot imagine why the ferrous oxalate developer has fallen into disfavour; the latitude of exposure is enormous, if only a fair printing negative is desired. Its defects may be summed up thus:—

Less than one unit of exposure will give an under-exposed negative utterly useless for any process.

One unit of exposure will give an ideally perfect negative, clear glass in the deepest shadows, but may require very prolonged development with the strongest solutions possible.

Two units of exposure will give a brilliant negative suitable for platinotype, developing usually in three or four minutes.

Four units of exposure will give a good silver printing negative, developing in less than a minute.

The time occupied in development depends necessarily very much upon the degrees of contrast in the subject. These remarks, therefore, apply primarily and more particularly to those of no undue extremes of light and shade; in a word, to those subjects which photography is capable of rendering artistically in monochrome.

Cases, however, occur which present more than ordinary difficulty in microscopic objects; for instance, preparations of insects of a dense non-actinic brown as the thorax, while the wings are almost perfectly translucent. In ordinary every-day photography an analogous case is presented by a distant snow-clad range of mountains with dark near foreground. In these cases a very prolonged exposure is necessary in order to preserve luminosity in the deep shadows, but accuracy of exposure is only the more essential, and then a well-watered developer—or, more simply, a nearly-exhausted developer—will secure the desired result.

I do not think that many photographers whose experience has been confined to silver printing alone, are capable of judging what qualities in a negative are necessary for other processes. For my own purpose I prefer the minimum exposure allowable —that is, the ideally perfect positive collodion picture on glass developed or otherwise brought up to printing density, a type of negative in vogue on the Continent some fourteen years ago for silver printing by Angerer, of Vienna.

Of course, we all know that albumenised paper presents extraordinary facilities in the hands of expert printers for obtaining good results from very different classes of negatives. It is, in my opinion, a dangerous property, and one that has done much to retard progress from the want of a definite standard of quality in negatives.

But I am wandering from my subject, which is the Woodbury process. Here I am at home, for I have found in it a process which will do all I require without retouching, if the negatives are right.

Mr. Evans will confirm my statement that if a negative retouched in any way comes to me, the first thing I do is to remove the retouching completely. But I willingly confess that I sometimes retouch extensively, but it is entirely limited to the inevitable process known as spotting, for which the Woodbury process offers facilities which are simply irresistible. Plates of commercial makes do sometimes have slight pinholes or opaque spots. Microscopic objects abound with dirt specks in the mounting. All these are remorselessly cut away, as they are developed as projections easily removed either on the gelatine relief or the metal mould. But I have not yet dared to meddle with the modelling that nature does, for the simple reason that with the gentlest guidance she will do it for me.

I am glad, therefore, to have had this opportunity of explaining their *raison d'être*.

Patent Intelligence.

Applications for Letters Patent.

369. James Yate Johnson, 47, Lincoln's Inn Fields, Middlesex, for "Improvements in printing frames for printing photographs and the like."—(*Jean Charles Ambroise Hermite*, France.)—Dated January 10th, 1887.

Specifications Published during the Week.

2,365. Charles Day Durnford, of the Ordnance Store Department, Edinburgh, in the county of Midlothian, N.B., Major and Assistant Commissary General, for "Improvements in photographic cameras."—Dated February 18, 1886.

The patentee says:—The base of the camera is made in two parts, which are hinged together, and on the edge of one of these parts is erected the front of the camera, which front may be made in any convenient manner with the usual aperture lens and other appliances. The front part of the base is of sufficient size to enable the hinder part thereof to be turned up to enclose the back and other parts of the camera when desired, and a rod is fitted which may slide in one or more sockets, on or in the base, and enter a bracket formed therefor on the front part or edge of the base to make the whole base very rigid, and, to assist in producing this effect, the end of the rod, and the aperture in the bracket into which the same enters, are preferably bevelled, whereby the rod is wedged in position. To the rear of the base on each side are fitted extension pieces which are so hinged as to be capable of folding in alongside the rear edge of the base, and of being opened out in continuation of the lines of the sides of the base in all positions, being on the same plane therewith, and on these two extension pieces may be the usual racks for the extension of the camera. When these two pieces are closed alongside the rear edge of the base, the same may be held in position by a ┬ piece on the end of the aforesaid sliding rod or otherwise, and when these two pieces are opened out the same may be held in position by blocks or chocks on the bottom of the back of the camera, or otherwise.

The back of the camera is made as is usual of a frame divided into two complete frames or parts, which are extensible the one from the other, but these two parts are not connected together by the ordinary transverse bar and other appliances, but by two preferably ∟ shaped levers, one being on each side. One end of each lever is pivotted on a bracket projecting from one part of the back, while the other end is jointed in the proper position to the other part of the back, and a tail-piece may be fitted on the rear side or elsewhere of the lever, which can work in a socket formed therefor, and can act as a stiffener, and, if required, as a stop. A sliding stop also is preferably fitted to clamp the lever when the two parts of the back have been duly separated, or are in other desired positions in respect of each other, and the parts of the stop and lever so in conjunction are preferably bevelled, whereby the stop and the lever are wedged in position. On the top of the back may be fitted a suitable slotted bracket projecting from one part of the back, in which slot travels a pin fixed in the other part of the back, and a sliding stop can also be fitted to clamp this bracket on, both being similar bevelled edges for the purpose aforesaid.

The bellows of the camera are formed in the usual manner, but to render unnecessary the usual size and depth of the back frame of the camera required by reason of the very deep folds of the bellows, all the rear or back part of my bellows are formed with extremely shallow folds for such a distance as may be deemed necessary, and these extremely shallow folds may be either very gradually or suddenly, or only comparatively suddenly, increased in depth, with the object of not intercepting the rays of light from the lens, thus permitting the use of a smaller back than is usual.

The dark slide may be fitted to, and used with, the back of the camera in any usual manner, or may conveniently be supported in position by an extension of, or a ledge on, the bottom of the back, being retained thereon by studs and sockets, while the upper edge of the slide could be held by a catch or otherwise, and the sensitive plates can be held in the slide in any usual or convenient manner.

The camera so made as aforesaid, can be hinged on one edge of the top or table of the tripod or other support; or, still more conveniently, the camera can be secured as usual to this top or table, which top or table can be hinged to the tripod or support at and on one side, and in either case the camera could be maintained in position by a hinged stay passing through a socket on the opposite side of the top or table, or of the tripod itself, or elsewhere, in which socket the stay could be secured by a clamping screw or other appliance, and on the loosening thereof the camera can regain its horizontal position, or the camera can be otherwise supported in its vertical position.

2039. Harry Lucas, of 32, Little King Street, Birmingham, lamp manufacturer, for "Improvements in photographic cameras and stands."—Dated 11th Feb., 1886.

The Patentee says:—I propose making my camera wholly or partly of metal, with the ordinary bellows body, and a loose base, and I attach the camera to the base by an improved method. I make what I may conveniently describe as two grooves, one near each end of the base and running crosswise on it. These grooves stand above the base, and face the ends near which they are placed. The back and front of the camera fit into these grooves, and are fixed by screws.

The camera stand I make of telescopic tubes, with improved methods of adjusting and fixing them, so as to regulate the height of the stand. By one method I put a female screw on the end of one tube which receives another, and on the inner tube, a free male screwed collar, with one or more cuts across the threads. The screw collar engages with the female screw, and binds the inner tube at any desired part. By another method I put a spring catch or bolt on one tube, which shoots into a hole or notch on the next tube, when the tubes are drawn out to the proper position.

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ORTHOCHROMATIC PHOTOGRAPHY.

BY J. B. B. WELLINGTON.*

Orthochromatic photography, although not new, is at the present time receiving a large amount of attention both by dry plate makers and photographers. It is a curious fact that a discovery to render the yellows lighter than the blues was not taken up with more zeal at the time of its discovery, and that it should have laid semi-dormant for some years until a commercial firm takes to supplying the public, which starts it into life again. I am referring only to England, as on the Continent they have employed it for some years, but we English are always somewhat behindhand in taking up a new discovery.

I am not going to discuss who is the legitimate claimant of producing orthochromatic effect in photography; but it is my intention this evening to give you the results of my experiments as far as I have gone (there is nothing original in the chemical I employ, it being erythrosin, and that was discovered years back), and to place in your hands a really good orthochromatic formula, but with one drawback—they will not keep many days.

The formulæ which have been published, compounded with eosine and ammonia, into which dry plates are to be dipped, have in my hands proved useless, and I believe others have found the same. One of my experiments shows me that chloride of silver, dissolved in ammonia with eosine and used as a bath, gives orthochromatic effect, and I should imagine that if a plate is made containing chloride of silver, and then bathed in a solution of ammonia and eosine, it ought to answer; probably this may account for the failures of those using the ammonia eosine bath with ordinary plates. After various experiments with different compounds with eosine or erythrosin, I found that carbonate of silver, dissolved in excess of carbonate of ammonia and mixed with the erythrosin, gave me the best effect.

The orthochromatic effect in a plate is due not to eosine or any other stain being an optical sensitizer, as some state, because you may stain the film as much as you please, still the yellows will refuse to impress themselves upon the film; but I believe it is due more to a chemical change, which is produced by having free silver present as well as a new compound formed with the erythrosin.

Although I discovered the above (*i.e*, the use of silver carbonate with eosine) quite independent of anything that had been published, I see that I have been somewhat forestalled in the publication of the formula, as last week in the News appeared a formula with ammonia, silver, and eosine, by Vogel, and, I think, the week previous another formula containing fluoride of silver, carbonate of ammonia, and eosine, which practically amounts to the same as I have given above. Mr. Hastings will bear me out in what I say, as I confided my formula to him some four or five weeks ago. However, I need hardly trouble you with all this.

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* A Communication to the London and Provincial Photographic Association

After trying various proportions, I find the following to work fairly well :—

Silver nitrate	20 grains
Ammonium carbonate	90 ,,
Water, distiled	16 ounces
Erythrosin (2·100)	10 drachms

The plates are placed in this for two minutes. A rinse in distilled water gives less chance of stains, and then placed in a rack to dry. Let me here state that if they are used in the moist condition the orthochromatic effect is practically *nil ;* they must be used quite dry. By this treatment the plate is rendered three times more sensitive.

I must insist upon the necessity of using only ruby light, the plates having now become so sensitive to yellow that the greatest precaution must be taken in handling them.

My chief reason in not giving you this formula before was the great difficulty of developing the plates free from fog ; this I am glad to say I have now overcome. I pass round a plate half of which is quite free from fog. This was got rid of by soaking the exposed plate before developing in the following :—

Potassium bromide	120 grains
Ammonia	½ ounce
Water	12 ounces

Do not allow to remain more than thirty seconds, well rinse under the tap, and proceed to develop with any of the usual developers—ammonia, potash, or ferrous oxalate.

If there be much blue in the object to be copied, a yellow screen must be used if exposure is to be made by daylight, although by gas or lamplight it is quite unnecessary. The best effect is always secured by gaslight exposure.

A very good substitute for coloured glass is to colour a collodion film and strip it from glass. The glass should be rubbed over with talc or a solution of wax in ether, and well polished off, and coated with collodion containing methyl orange. The dried film should appear decidedly orange. The stripped film can then be gummed to the cap of lens, having cut out the centre first, and used preferably behind the lens.

The carbonate of silver and erythrosin may be mixed with an emulsion, but requires great care. It should be mixed at as low a temperature as possible, and the plates used as soon as they are dry, as their life is very short. The orthochromatic effect is very marked, and the speed increased about ten times. If anyone is desirous of trying this, I give the following :—

Emulsion (containing, say, 200 grains silver)	10 ounces
Silver nitrate	10 grains
Ammonium carbonate...	45 ,,
Erythrosin (2·1000)	5 drachms

Before development they must be treated with the ammonia and bromide.

Very fine results can be obtained from collodion emulsion—in fact, the results far surpass gelatine, and can be used by daylight without the necessity of employing a yellow screen at all, but, alas ! like gelatine, do not appear to keep any better.

The bath for a collodion emulsion plate is best made as follows :—

Silver nitrate	10 grains
Ammonium carbonate	45 ,,
Water	2 drachms
Spirit, methylated	8 ounces
Erythrosin (2·1000)	5 drachms

Dissolve the silver in a test-tube by heat in two drachms water, and add the carbonate of ammonia bit by bit till all dissolved. Add the spirit gradually to the hot solution, and finally the erythrosin. Place the dried collodion plate in this solution for two minutes, and dry ; the plate, before development, to be treated with the ammonia and bromide, and developed by ferrous oxalate, three to one, to each ounce of which add three grains of bromide.

If mixed with the emulsion, it begins to fog at the end of three days, so it is better to dip the plates as required. The exposure is only four times more than a fairly ordinary rapid gelatine plate by daylight, and by gaslight they are about equal.

The action of the erythrosin silver compound renders the collodion film exceedingly tough, very much like an alumed gelatine film, and is very difficult to scrub off the glass afterwards.

I must now leave you to try for yourselves all I have stated, and trust some of our members will make further experiments to produce something better and more lasting than what I have done.

Correspondence.

RETOUCHING.

Dear Sir,—Mr. George Smith, in a most interesting address to the Society of Great Britain on "Lantern Slides," as reported by its Journal of Transactions of December 31st, said, they were, on his part, "an earnest endeavour to raise the position of photography to that of a true art—a position which I believe it to be fast losing, as evidenced by the dangerous prominence given by the Photographic News to the so-called art of retouching." At reading this I open my eyes wide and rub them. If I know a photographic serial that more than another sets a correct value on retouching—and that not a high one—it is the Photographic News.

It must be a slip of the speaker, a slip of the pen, or a slip of the printer. Another paper, and not yours, must have been meant.

While, sir, it is a hopeful sign of better things when so great an authority as Mr. Smith denounces the *evils* of retouching, they will never, in my opinion, be greatly abated until the customer of the photographer is taught to set a true value on untouched work. This can only be done through those papers the customer reads.

William Adcock.

TOURISTS' CLUB.

Sir,—As many amateur photographers seem desirous of securing the benefits of a Tourists' Club, the Committee of the Pedestrian and General Tourists' Club have had under their consideration the practicability of obtaining for amateur photographers the particular convenience which they find necessary for their work when making photographic tours. The Committee are quite willing to do their best to make these arrangements for amateur photographers who may join the Pedestrian and General Tourists' Club, if the number of such members is sufficient to cover the expenses necessarily incurred in making the arrangements.

I am not myself a photographer, but with the assistance of any suggestions which you, Sir, or any of your correspondents may make, and the valued co-operation of Mr. H. A. Hood Daniel, of Bristol, who has kindly undertaken to assist me, I do not fear being able to make perfectly satisfactory arrangements.—Yours very respectfully,

H. Cope West, Hon. Sec.

39, *Hamilton Square, Birkenhead.*

AMATEUR PHOTOGRAPHIC ASSOCIATION.

Dear Sir,—Will you allow me to call the attention of your readers to a slight error in the notice of this Society in your Year-Book. You have in one place omitted the name of H.S.H. the Duke of Teck as a Vice-president, and you have given the name of Mr. Bassano as executive artist, although he has withdrawn from that position.

Trusting that in justice to Mr. Bassano, as well as to the Society, you will kindly insert this correction,—I remain, dear Sir, yours truly,

Arthur J. Melhuish, Hon. Sec.

12, *Old Bond Street.*

Proceedings of Societies.

Photographic Society of Great Britain.

The ordinary monthly meeting was held at the Gallery, 5a, Pall Mall East, on Tuesday evening last, the 11th inst., James Glaisher, F.R.S., President, in the chair. The minutes of the December meeting having been read and confirmed, the following gentlemen were duly elected members of the Society :—C. G. Collins, London ; W. D. Fenning, Hertford ; J. Martin, London ; and H. M. Smith, London.

The **Chairman** said that he had been expecting a paper, but up to the last moment this had failed; Capt. Abney had then stepped forward to the rescue, and would read a paper concerning the Measure of the Densities of Photographic Deposits, with some remarks on Sensitometers.

Capt. **Abney** said that, failing a paper that evening, he thought it would prove of interest to show before that Society the beginning of some experiments he was engaged upon for the measurement of the density of gelatine plates, a part of the more complete arrangement he intended showing in March next. The first question arose, supposing anyone wished to measure the density of plates, how would they proceed? By projecting an image of a photograph upon a screen. the density of any part could be measured by Rumford's method. Objections might be raised that the results were not always accurate. This objection he had met completely by the following plan. Any convenient source of light may be used for the purpose; a common candle (Government), Capt. Abney said, was more accurate for photometric experiments than the standard candle. Upon this occasion he was using an oil lamp fixed up as arranged in an ordinary magic lantern, or he should say optical lantern. Besides this lamp there were the lens, condenser, an adjustable rod for casting a double shadow on the screen, and the translucent screen itself. upon which an image passing through the lens is received; diaphragms were employed to sharpen up the image, and there was an arrangement for moving a negative about in order to test any part of it. At a little distance from the lamp a metallic mirror was erected, and the beam of light reflected from this surface became instrumental in causing the second shadow of the perpendicular rod to appear. Before reaching the rod, however, the beam had to pass through slits in a rapidly revolving photometer. It being necessary that an equality of shadow should be manifest on the screen by the aid of the naked light before any portion of a negative be superimposed, an arrangement had been contrived to alter the area of opening in the revolving ebonite discs by a fine screw adjustment capable of clamping at a quarter turn. A scale of degrees fixed around the circumference indicated the required amount of opening or closing necessary to obtain equal density of the two shadows, and the index given became the zero or starting point for other readings. The photometer was actuated by a Siemens motor, and the small electric engine derived its initial energy from five Grove cells, although it was stated that the three Leclanché cells would work it in ordinary practice. This method was then practically demonstrated by a measurement being made and repeated. In both instances the reading of 41·5 degrees was given. In practice, Captain Abney said there should not be a greater variation than one degree, and the arrangement was so simple that anyone could fix it up and use it. He had made use of Spurge's sensitometer, which those present would remember was composed of boxes with different-sized holes. Every third number doubling the amount of light, had been tested, and a chart from it prepared. The curve given showed it to be the most accurate sensitometer there is up to the present time. Another chart illustrated the photographic value, which very nearly coincided with the optical method. By this means Captain Abney said that anyone could make their own sensitometer, using the optical plan to check each sensitometric square. He recommended the first exposure to be ten seconds, the next twelve and a half, and so on in the same ratio of two and a half advance. For the screen a grease spot might be substituted, which need not be larger than a pin's head. He hoped soon to show a modification of this plan adapted to spectrum plates of different silver salts. In concluding, Captain Abney said that the method he now brought before the Society was that which he utilised in measuring the density of different parts of the corona around the moon's limb in the photographs of the recent eclipse expedition. By this means they would be able to estimate the degrees of brightness by the density of the image.

The **Chairman** wished to know whether Captain Abney found the Government candle better than the Standard for all scientific measurement, and does he think the plan now shown will do away with the necessity of candles altogether?

Captain **Abney** merely wished to mention that he found less variation with Government candles than the usual Standard candle.

Friese Greene suggested that measurements of any density from black to white could be obtained by means of two lamps, one, say, 20-candle, and the other 1-candle power; the ratio could be calculated from a fixed scale along the base-line.

Captain **Abney** remarked that such a plan would not isolate any part of a negative as his method did.

H. **Trueman Wood** suggested that if the difference in position of the two lights were too great to be convenient, a light might be used by the side of the screen, and a second mirror used.

This being the last ordinary meeting previous to the annual meeting, the Chairman pointed out that it would be necessary to appoint auditors and scrutineers. In the former capacity F. B. Cobb and F Ince accepted duty; and in the latter, G. L. Addenbrooke, W. M. Ashman, W. Bedford, W. K. Burton, F. B. Cobb, and G. Scamell. The Chairman said that voting papers would be sent out after the nominations which closed on the 19th inst., and the election would take place on February 8th, the night of the annual meeting. The next technical monthly meeting will take place on the 25th inst.

South London Photographic Society.

The annual lantern meeting of this Society was held on Thursday, the 6th inst., at the large Hall of the Society of Arts, John Street, Adelphi, W.C, when T. **Bolas**, Vice-President, occupied the chair.

There was a very good attendance of members and friends, and, as usual upon these occasions, many ladies were present. The Chairman, in opening the proceedings, said his duties were remarkably easy, inasmuch as lantern displays of the kind they were assembled to witness did not require any talking. There was a point, however, to which attention might be directed on account of novelty, and that was the mode of illumination about to be employed. It was an electric arrangement supplied from a dynamo machine working in the basement, and this was supplemented with a series of storage batteries. One of Siemen's lamps was fitted to the lantern, and an illumination equal to something between three and four thousand candles would be obtained. The reading lamp, a Swan and Edison incandescent, was in the system, as also were all the lights in the building. Mr. G. Davenport, who would work the lantern, had devised a new slide-carrier that was both simple and ingenious, and this would be used for the first time that evening.

More than two hundred slides were then exhibited upon the large screen, a disc of eighteen feet being projected. The splendid illumination obtained showed that many of the transparencies sent for exhibition had been prepared for a much less intense light, but, on the whole, the display was eminently satisfactory.

C. **Pilkington** showed several well-known views near London, all of which were coloured with very good effect.

W. M. **Ayres**, as usual, illustrated the capabilities of wet collodion transparencies toned with platinum and gold; many of them were, however, much colder in tone than it is customary to produce.

T. **Charters White** divided attention equally between photomicrographs and the less difficult studies by the wayside.

F. A. **Bridge** showed a few of his Belgian series.

J. **Gale** illustrated scenes in Sussex with a magnificent series of wet collodion transparencies from gelatine negatives, which elicited much applausse.

W. **Wheeler** followed with a short series of Aston Hall Warwickshire.

J. B. B. **Wellington** represented the collodio-bromide process with a large number of slides.

George Smith exhibited a number of various subjects produced in Woodburytype.

S. A. **Allen** showed several subjects wherein both positives and negatives had been made on commercial gelatine plates.

F. **York and Son** sent two of their lecture series, which afforded much amusement to the juveniles present.

W. **England** showed a series of statuary subjects.

The principal peculiarity in G. Davenport's new patent slide consists in a prolongation of the metallic runner that carries the slides. This terminates in a curtain screen, that in travelling along the guides covers the lens. During the brief period an automatic change of subject takes place, the effect of which upon the screen was exceedingly good. At the termination the usual vote of thanks was accorded.

London and Provincial Photographic Association.

At a meeting of this Society held on Thursday evening, the 6th inst., J. B. B. **Wellington** discoursed upon "Orthochromatic Photography." The paper appears on page 29.

Thursday next, exhibition of optical apparatus and lantern transparencies. This will be a ladies' night, and the proceedings will commence at 7.30.

CAMERA CLUB.

A MEMBER'S lantern slide meeting was held on January 6th, when slides were shown by J. H. Knight, J. Gale, Barclay, and Dresser. A number of those recently received in exchange from the American societies were also put through the lantern.

The chief feature of the evening was the exhibition of a series of fifty slides, accompanied by a very interesting lecture by J. H. Knight, in description of scenes, manners, and customs in Madeira.

On the 20th January, the subject for the evening will be "The Development of Bromide Paper Prints," the discussion to be opened by Andrew Pringle.

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

THE monthly meeting on 6th January took the form of a lantern exhibition, and was largely attended by the members and their friends.

A very interesting series of slides, entitled "In and about Arbroath," was shown by J. Geddes, who delivered a running description of the principal points of interest. J. Geddes, who is an expert lanternist, objects strongly to the 3¼ by 3¼ size which has so long been thought necessary, and makes all his slides on plates 6½ by 3¼. This size of picture is, of course, not adapted for dissolving, but, being pushed slowly through the carrier, it has a very good effect, and gives a better idea of the subject than the regulation-sized slide. J. Geddes' transparencies were made, some on wet and some on dry plates; the comparison was in favour of collodion.

A series of slides sent by A. Pumphrey was next exhibited. They were on his new lantern plate, and were, on the whole, very good, a number of them being very near perfection. The tone, clearness of high lights, and general vigour were commented upon, and the opinion of the members was, that the plates seem admirably adapted to the purpose for which they are designed.

Talk in the Studio.

THE NORTH LONDON PHOTOGRAPHIC SOCIETY.—The Secretary writes :—"It has been decided to change the name of the North London Amateur Photographic Association to the North London Photographic Society. This Association, which had its origin in a very humble manner, has now grown far beyond the expectations of its promoters, and the members consider that it is no longer wise to observe any exclusiveness in the admission of members. Therefore, believing that it will be mutually to the benefit of professional, amateur, and dealer, to have a general photographic debating society in the northern suburbs, they have decided to throw open its doors and admit everyone interested in the advancement of photography. As it will be necessary to form new rules, and to elect officers for the present year, an open meeting will be held at Myddelton Hall, Upper Street, Islington, on Tuesday, the 18th inst., at 8 p.m., and any one wishing to join the Society in its reconstructed form is invited to attend and take part in the business of the evening.

GLOSSOP DALE PHOTOGRAPHIC SOCIETY.—At the usual monthly meeting on the 4th inst., it was resolved that the Society give a lantern entertainment to the inmates of the Glossop Workhouse, subject to the approval and consent of the Board of Guardians.

CAN PHOTOGRAPHY LIE ?—The above is the title of a paper by J. Hubert, which we are compelled to leave over till next week.

A DEVELOPER FOR EOSINE PLATES.—The following is given in the *Mittheilungen*, and is attributed to Sachs: - *Solution No.* 1.—Water, 500 c.c.; sulphite soda, 100 grammes; pyrogallol, 14 grammes. *Solution No.* 2.—Water, 1 litre; carbonate soda, 50 grammes. For use, mix equal volumes of No. 1 and No. 2.

PHOTOGRAPHIC CLUB.—Owing to the exhibition meeting of this Club taking place on 26th January, the lantern night will be held on January 19th. The discussion will be on "Lantern Makers." Visitors invited.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

T. PINDAR.—We will send you a copy by post, and this will give you fuller information than we can afford you in this column.

ARTHUR J. MELHUISH.—Thanks; it shall be seen to.

E. DEBENHAM —

Nitre	17 parts
Sulphur	6 ,,
Orpiment	2½ ,,

These materials should be finely powdered, quite dry, and well mixed. Mix by means of a sieve, and not in a mortar, and don't forget that orpiment is a compound of arsenic, and very poisonous.

SILVER.—Make your bath alkaline by the cautious addition of carbonate of soda, and do not use too strong a toning solution.

A BRISTOL AMATEUR.—This correspondent, who has experienced the reversed action of light as the result of over-exposure, writes as follows:—"During the late frost, I was struck with the beauty of design in the hoar-frost on the window panes, and took two small negatives of them. Since reading an article in the present YEAR-BOOK, I have made transparencies from them; but, before that, I was ignorant of gelatino-chloride. In turning over some old YEAR-BOOKS, I saw that an ordinary gelatine plate, exposed under a negative to two minutes' gas-flame, would answer. Trying it, and failing to get anything, I exposed a plate in the same way to about thirty seconds' diffused daylight—a north window. On developing with ferrous oxalate, I found I got a reversed negative instead of a transparency, and, I think, as sharp as the original. I can see little difference in them. This may not be new to some of your readers, but I think it will be to most, for, in looking back through old volumes of the YEAR-BOOK, and my recollections of the NEWS, I can find nothing but very elaborate processes to make reversed negatives. I send prints from both negatives, and it may interest some of your readers to try it."

J. JOHNSON.—It cannot be done—at any rate, if one keeps strictly to the text of your letter; but all you really require is a matter of very elementary arithmetic. Your best way will be to consult a treatise on this subject.

J. M. BROWNIG.—A weak solution of chloride of iridium will give them a very fine black tone, but as this material is rather expensive, about twenty grains to a pint of water is a convenient strength, and the transparency must be well washed from the fixing material before being toned. After treatment with the iridium solution you can pass through weak hypo, and once more wash in order to remove the chloride of silver formed by the action of the silver image on the chloride of iridium.

E. ASKEW.—See pages 161 and 162 of the YEAR-BOOK.

J. A. M.—A weak solution of cyanide of potassium is the best thing, but it must be used with caution.

A. ROGERS.—You can, we suppose, register it, but not as a photograph.

JOHN TERRAS.—Make a strong solution of shellac in spirit, a solution nearly as thick as treacle. Now mix this into a soft paste with carefully dried whiting.

WM. KING.—We have heard some rumours about the matter, but have no reliable information.

N. R.—We are sorry, but cannot help it: it is not our department.

W. H. THOMSON.—1. Dissolve it in alcohol, but do not make the solution too dilute: four ounces to the pint will prove a convenient strength. 2. Not unless it is previously dried.

PHOTO.—Apply to the nearest magistrate for a summons against the party for illegally detaining them.

ED. A. RICE.—From what you say, we understand that it is a silver print—one done on bromide of silver paper; but we can hardly judge of its merits as a print without seeing the negative. Still, if we assume the negative to be a good one, we must regard the print as anything but a success.

ESSEX.—The lens you mention should serve well for landscapes, but with a small stop—say half an inch in diameter; indeed, we do not know of any lens which is better.

D. P.—We cannot give opinions as to the validity of patents, but do not think you need hesitate to do as you propose.

C. D.—Not every photograph marked "copyright" is copyright; but should a copyright really exist, the fact of your selling under the pretence of giving them away will not avail you.

S. H. DUGG.—It will answer, no doubt, but a paraffin lamp would be cheaper, and, perhaps, more convenient.

S. H. OWEN.—Thank you very much for the suggestion. We will take an opportunity of seeing them.

THE PHOTOGRAPHIC NEWS.

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ON A MEANS OF DETERMINING WITH PRECISION THE FOCAL LENGTH OF LENSES.

Various methods are in common use for determining the focal length of lenses. Of these many are sufficiently accurate for ordinary photographic purposes, but none that we know of (commonly used) give absolutely accurate results, even if the observations, measurements, &c., be carried out with absolute accuracy; and this for the reason that they all, or most of them, assume the correct point from which to measure the focal length to be the optical centre of the lens, whereas this is not the correct point. The correct point is in all cases, more or less, behind or in front of the optical centre. It is commonly known amongst opticians as the "Gauss point," for the reason that an optician of the name of Gauss very thoroughly investigated the means of finding its position.

In a recent number of the *Mittheilungen*, Dr. Hugo Schroeder, of London, has an exceedingly interesting article on the subject of the Precise Determination of the Focal Length of Lenses, and although we repeat that, so far as photographers are concerned, the ordinary methods of determining the positions of the optical centre, and measuring from that, are accurate enough, and result in a far less error than that likely to be due to errors of measurement and observation, still it is well to know a way of determining focal lengths which is really theoretically faultless.

We first of all remind our readers of the common—and, according to Dr. Schroeder, very inaccurate—method of determining focal length by drawing out the camera to such a distance that the image on the ground glass is of the same size as a near object, measuring the distance between ground glass and object, and dividing this distance by four.

Dr. Schroeder's method is the same as the above, so far as the first operations are concerned. He extends his camera till the image on the ground plan is of the same size as a near object. The rest of the operation is, however, entirely different. Dr. Schroeder next focusses for a distant object, and *takes the difference between the two amounts of extension of the camera*, which is the true focal length.

For example, if the distance between any point of the lens and the ground glass were 23 inches when the image was the same size as a near object, and the distance between the same point in the lens and the ground glass were 11 inches when a distant object was focussed, the true focal length would be 23 − 11 = 12 inches.

This is the method described as briefly as possible. Various points of detail are, however, of great ingenuity, and deserve special notice. For example, the manner in which an image on the ground plan is produced of the same size as a near object, with great accuracy, deserves the attention of all.

A piece of opaque and stiff paper or other similar thin substance is taken. It may be a couple of inches or so longer than the length of the ground glass of the camera. The ground glass should be of such size that a fairly large angle is included, even when the camera is extended to such a length that the size of image equals that of the object.

The width of the strip of paper may be a few inches. Two small holes are made, one near each end. Their distance apart must be somewhat less than the length of the ground glass.

The strip of paper is laid on the rough side of the ground glass, and a pencil is caused to make a black spot through each hole.

The strip of paper set up opposite the lens, with a candle behind each hole, forms the object. The two points on the ground glass—of course exactly the same distance apart as the holes in the paper—form a means of very accurately making the image of the same size as the object; for, when the camera has been so adjusted that a sharp image of each hole just superimposes itself on each pencil dot, the size of image and of object will be precisely the same.

A second most ingenious arrangement is a substitute for the parallel rays from a distant object, necessary to get the second of the two positions of the ground glass, by the use of which substitute the whole estimation can be performed without moving the position of the camera or lens.

The only necessary appliance is a pocket telescope. This is first of all focussed for some distant object. It will be understood that when the term "distant object" is used, it is intended to mean some object so distant that no appreciable alteration of focus would be necessary for an object ever so much farther distant. With an ordinary pocket telescope there will probably be no appreciable difference for an object distant a few hundred yards, and for a fixed star.

The telescope once focussed for the distant object, the adjustment must not be altered till the observations have been completed.

A light is now placed behind the ground glass, and between the ground glass and the lens is placed a very sharply-defined semi-transparent object, such as a good crisp negative. The telescope is next placed near the lens, at the side remote from the ground glass, and the position of the negative is altered, till it is seen quite sharply looking through both the telescope and the lens. The distance between the ground glass side of the focussing screen and the image side of the negative is now the precise focal length of the lens.

It will be seen, that to perform the operations as just described, an ordinary camera cannot be used, as it would be practically impossible to gain access to the negative to adjust its position. An open stand or frame, for holding the strip of paper with the two perforations, the lens, the ground glass, and afterwards the negative, is necessary, and also a means of adjusting the position of each one of them.

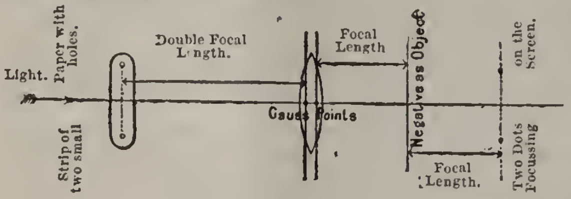
To perform the whole operation with the ordinary camera, we propose the following modifications.

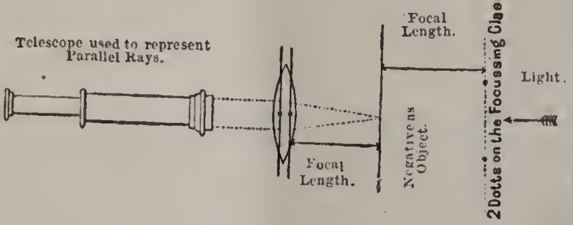
The ground glass is prepared with some figuring on the ground side, which figuring can be focussed for—a few scratches would be sufficient; but perhaps a fly's wing, placed between the ground glass and a microscope-slide cover-glass, cemented on to the ground glass, would make the best figure.

The operations are all the same. till the telescope is adjusted; but now, in place of making use of the negative on some such object, we rack the ground glass towards the lens till the figuring on the ground side is quite sharp, looking through both the lens and the telescope, and very carefully measure the amount of racking necessary. This represents precisely the focal length.

It is to be further observed that, if it be desired to determine the position of the "Gauss point," it is only necessary to measure from the second position of the ground glass, towards the lens, the focal length already determined, when we have the position of this point, called by Schroeder "Haupt-punkt," literally "head point" or "principal point."

The following figures, which are taken from Dr. Schroeder's article, explain themselves :—




Telescope used to represent Parallel Rays.
Focal Length.
Focal Length.
Negative as Object.
2 Dotts on the Focussing Glass
Light.

FRENCH CORRESPONDENCE.

French Photographic Society—Exposure Shutters—Salt as an Accelerator—Photography without a Lens—Eastman Papers.

French Photographic Society.—The January sitting of this Society has presented nothing new or very interesting, but was limited to the inevitable display of exposure shutters, those of M. Gorde and of M. Gilomé. This last shutter is chronometric, and will give exposures of varying duration from the fiftieth of a second up to two minutes; it has, like the shutter of M. Boca, a sliding-piece which rises, and which, when it reaches a certain point, releases another sliding piece, which immediately descends. A perfectly regulated clockwork movement permits one to fix beforehand the duration of the exposure. It is to be regretted that this ingenious instrument does not give greater rapidity, for the fiftieth of a second is often not sufficiently rapid. We further note the presentation by Count Du Chastel of a modified stereoscope. The author of this communication was struck by the unnatural appearance of stereoscopic prints, caused in great measure by their being cut to that fixed dimension which has hitherto been considered the best. Evidently, says he, stereoscopic views are taken on half plates: and when cut, a great part of the foreground is removed as useless. It was thought right to act thus because the perspective appeared to be exaggerated in the extreme; but when the double view is placed under the stereoscope without being cut, it is surprising to see how much this instrument gives harmony to the lines, and corrects defective perspective. In support of his demonstration, M. du Chastel produced several views, some cut to the ordinary size, and others cut much longer. The general opinion was that there was a very great advantage in retaining the foregrounds; and an opinion was expressed that opticians should enlarge their instruments, so as to permit the use of slides of larger dimensions. The Americans, it appears, have recognised the truth of the fact announced by M. Du Chastel, and act accordingly.

Common Salt as an Accelerator.—M. de Villechole has continued his experiments on the use of common salt as an accelerating and intensifying agent. The plates presented by him to the Society are some very intense, and have come out exceedingly well. These are those which had a preliminary bath in a solution of ordinary salt. The other plates, treated in the ordinary manner, had only yielded very incomplete results, in spite of a very long development. He estimates the action produced by common salt as doubling the intensity. A member of the Society, using pure chloride of sodium, had not been able to obtain any appreciable difference. We had supposed it would be thus, and it is very probable that the fact in question is produced by the notable traces of sulphate of magnesia which sea salt always contains; there remains, therefore, the same experiment to be made with pure sulphate of magnesia. We have been making experiments similar to those of M. de Villechole with ordinary kitchen salt, and our results have been less pronounced than those of our colleagues; this evidently arises from a different composition of the product which we employed.

Photography without a Lens.—Captain Colson, the author of an interesting study on "Photography without a Lens" (published by Gauthier-Villars), exhibited prints obtained in this manner. The process of M. Colson is founded on the employment of a small hole as the sole optical appliance. The principal advantages which this system presents are the following:—It lends itself admirably to the production of panoramic views in cylindrical perspective, permitting one to obtain with one exposure either a quarter of the horizon, or an entire panorama; it is suitable for topographic projection by means of negatives, giving, by very simple geometric constructions, the height of all the visible objects within an angle of ninety degrees from the summits to a known base. But that is not all; with this wonderful little hole M. Colson obtains stereoscopic views that may be examined at the distance of distant vision without special apparatus. It will be recognised that an apparatus of this simplicity may be easily and economically constructed by anybody. To speak truly, it is useful to add, that the productions thus obtained are far from exhibiting the fine sharpness of those produced by lenses; they may, however, suffice in many cases. Neither can we, until something fresh takes place, reckon upon realising instantaneous impressions by the help of this very, very little hole. It is about three-tenths of a millimetre in diameter; one of the proofs shown required an exposure of twenty seconds, the distance between the plate (gelatino-bromide) and the hole being thirteen centimetres. To achieve a notable reduction of the exposure, it would be necessary to have plates of very different sensitiveness to those in actual use. The fact is, nevertheless, very interesting, and certainly is worthy of all our attention.

Eastman Papers in Paris.—The establishment of Nadar is very actively occupied in pushing in France the papers of Eastman; and the apparatus is ingeniously created for the use of these papers, both negative and positive. M. Paul Nadar presented to the Photographic Society a remarkable roller slide of Eastman, and some magnificent enlargements, which were—the latter especially—the objects of universal admiration. As for the permanency of the images obtained on positive paper, much has been written on the subject; and some eminent scientists incline to the idea that we may credit them with a very long, if not unlimited, durability. While being quite of opinion that images formed by pure metallic silver are less alterable than those which have albuminate of silver for a base, we are not the less disposed to counsel, that this inalterability should not be insisted upon, except with the greatest reserve, silver being, in fact, a metal attackable by all acids. There are found in the substance of the paper, and still more in gelatine, putrescible organic substances, which may, resulting from fermentation, produce acetic acid and other compounds capable of attacking silver. It would be wrong, according to our view, to compare the stability of proofs of this kind with that of images in platinum. What may be affirmed, without fearing to go too far, is, that proofs obtained on gelatine bromide of silver paper give images the durability of which, under good conditions of normal freedom from moisture, will far exceed that of proofs printed on albumenized paper. This is, so far, a great advantage, although it would be rash to count on them as eternal. LEON VIDAL.

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.

I TRUST that I need make no apology to the readers of the PHOTOGRAPHIC TIMES for my choice of a subject. The knowledge of what has been done, and of the steps by which our present position has been attained, are indispensable to that intelligent excellence in the worker which is the surest guarantee of good work in the present, and advancement in the future. For several years I have been collecting materials for a history of photography, and I am glad to give my American friends the condensed results of my researches. I shall be pleased to hear of any criticisms or additions.

CHAPTER I.—THE ORIGIN OF PHOTOGRAPHY.

Early Records of the Action of Light upon Matter.—Photography is the child of optics and chemistry. As neither of these sciences attained anything like a full development until the present century, it is not surprising that the art of taking photographs was unknown to our ancestors. And yet there are many facts that must have been known, even to the ancients, whose meaning, if rightly appreciated, would have led to the early discovery of the art of photography. For example, lenses are all but absolutely necessary to the taking of photographs, and a lens has been found among the ruins of Nineveh, a city which was destroyed more than a thousand years before the birth of Christ. This lens is now in the British Museum. During the Middle Ages, the manufacture and properties of simple lenses were well understood in Europe.

The changes produced by the action of light upon matter are so common as to be matters of every-day observation. At a very early stage of civilization the tanning or bronzing of the human skin by the solar rays must have been noticed, even if the black skin of the negro was not assigned to its true cause—a constant residence beneath the intense rays of a tropical sun. A hundred years before Christ, the Roman philosopher, Pliny, noticed and recorded the fact that yellow wax is bleached by exposure to sunlight. The Greeks knew well that certain gems—the opal and the amethyst more especially—lost their lustre from the same cause; while the great Roman architect and painter Vitruvius was so concious of the decolourizing effect of sunlight that he invariably placed his paintings in rooms facing the north.

The Alchemists and Horn Silver.—During the Middle Ages almost the only enquirers into the secrets of nature were the alchemists, who vainly sought the philosopher's stone which should transmute the baser metals into gold. But though their search was vain, yet, as so often happens, these experimenters—Roger Bacon, Albert Magnus, Paracelsus, and a host of smaller lights—although they did not find what they were looking for, yet they made many discoveries of great value. The store-house of nature is so rich, that even the blind seeker is rewarded. And so these alchemists became acquainted with some of the most powerful agents of modern chemistry—the acids, for example—and, as the centuries rolled by, their discoveries bore fruit.

Among those alchemists who experimented with the compounds of silver we find the name of Fabricius, who in 1556 published a book upon metals.

Horn-silver, or *lunacornea* as it was then termed, was the name given to a semi-transparent compound of silver and chlorine which occurred as an ore in the silver mines of Germany, but which Fabricius found could be prepared by adding a solution of common salt to a solution of silver nitrate. Fabricius and his co-workers appear to have been much surprised when they noticed that this silver compound—white when freshly prepared—quickly turned black when exposed to the sunlight; but as the fact appeared to have no relation to the object which engrossed all their thoughts—the search for gold—no attempt was made to enquire into the nature of this surprising change; a change which must also have been noticed by the miners who extracted the ore.

Schulz's Experiment.—During the seventeenth and eighteenth centuries many instances were noticed of the effect of light in changing the colours of bodies; but, as the result is most rapid and most striking in the case of the compounds of silver, it was to these that attention appears to have been chiefly directed.

In 1727, J. H. Schulze actually obtained copies of writing by placing the written characters upon a level surface previously prepared with a mixture of chalk and silver-nitrate solution. The rays of sunlight passing through the translucent paper blackened the silver compound beneath, except where it was protected by the ink forming the letters, and thus a white copy upon a black ground was obtained. Although we cannot, on the strength of this single experiment, assign to Schulze the title which Dr. Eder claims for him as the "discoverer of photography," yet it must be admitted that the experiment was a very remarkable one, and it is much to be regretted that it was not successfully and quickly followed up.

Scheele examines Silver Chloride.—Charles William Scheele, of Stralsund (then a Swedish town), was a distinguished investigator who may be considered as one of the founders of modern chemistry. In 1777 he made the first scientific investigation of the behaviour of silver chloride under the influence of light. First he noted the action of differently coloured light, showing that while the silver salt was quickly darkened by violet or blue light, the red and yellow rays had much less effect upon it. His results were confirmed by Senebier in 1782, who writes that "in fifteen seconds the violet rays blackened silver chloride as much as the red rays did in twenty minutes." But Scheele also discovered the *cause* of the darkening. He exposed chloride of silver to the action of sunlight underneath water; reasoning, doubtless, that the water would arrest and dissolve any substance which might be given off under the action of light. When the white salt of silver had blackened, Scheele poured away the water and added to it a little silver nitrate. Immediately a white substance was formed (owing to the silver nitrate combining with chlorine dissolved in the water) which was silver chloride formed anew. Thus Scheele proved that the effect of white light upon silver chloride is to decompose it, and cause it to give up some or all of its chlorine. As to whether the black residue is metallic silver (which appears black when in a very fine state of subsdivision) or is a compound known as silver sub-chloride (Ag_2Cl), that is a matter upon which chemists as yet are not agreed. Scheele's conclusions were doubted by Count Rumford, whose paper entitled "An Enquiry concerning the Chemical Properties that have been attributed to Light" was published in the Philosophical Transactions of the Royal Society for 1798. He considered that the changes observed were due to heat rather than to light; but his arguments were successfully controverted by Robert Harrup, who, in the case of the salts of mercury, at all events, conclusively proved (*Nicholson's Journal*, 1802) that light alone was the determining agent of the changes observed.

Invention of the Camera Obscura.—It was not till the close of the eighteenth century that any one, with the exception perhaps of Schulze, seems to have thought of applying the changes of colour produced by the action of light upon silver compounds to any practical purpose. And yet the instrument called the camera obscura had long been well known, and those who gazed upon the beautiful pictures produced by its agency, must often have longed to find some method by which they might be fixed and retained. Invented by the Italian philosopher Baptista Porta about the middle of the sixteenth century, the camera obscura at first consisted simply—as its name implies—of a darkened room to which light was admitted only through a single small hole in the window-shutter. In such a room, when the sun is shining brightly, a faint inverted image of external objects, as the houses, trees, &c., upon which the window looks, is seen upon the white surface of the wall or screen within the room which faces the window. Porta improved this primitive contrivance by placing a double convex glass lens in the aperture of the shutter, outside which a mirror was placed to receive the rays of light and reflect them through the lens. The image upon the screen within was thus made brighter and more distinct, and moreover shown in a natural or erect position. Crowds flocked to Porta's house in Naples to see these pictures painted by light, glowing with colour, and depicted with marvellous accuracy. Soon further improvements were made, and the camera obscura became a favorite adjunct to the country houses of the wealthy, often taking the form of a small circular building, erected, if possible, on a hill-top. The lens was then usually placed in the centre of the conical roof, with a slanting mirror arranged so as to reflect the light from surrounding objects downward through the lens; the picture so formed was received upon the whitened surface of a table placed within the little building. Such erections are still not uncommon in places of popular outdoor resort, and interesting discoveries are not unfrequently made by those who have gained admittance as to the doings of unsuspecting outsiders, who little think that their proceedings are pictured for the delectation of others. Now the photographer's camera is a miniature camera obscura, being nothing more than a well-made box having a lens at one end and a ground-glass screen at the other. Still a modern camera made by one of the masters of the art of cabinet-making as applied to photography, and provided with a battery of first-class lenses, is nothing less than a work of art, and is correspondingly expensive.

Early Visions of Photography.—A Chinese tradition credits the sun with sometimes producing pictures of the neighbouring objects upon the ice-covered surfaces of lakes and rivers. A similar idea must have possessed the mind of Fénélon, when, in 1690, he wrote his fable called "Une Voyage Supposé," descriptive of the imaginary journeys of an imaginary personage, in which the following passage occurs: "There was no painter in that country; but if anybody wished to have the portrait of a friend, of a picture, a beautiful landscape, or of any other object, water was placed in great basins of gold or silver, and the object desired to be painted was placed in front of that water. After a while the water froze and became a glass mirror, on which an ineffaceable image remained."

But it was reserved for another Frenchman, Tiphaigne de la Roche, to make a still nearer guess as to the manner in which "nature printed" pictures would one day be produced. In 1760 he wrote a book entitled "Giphantie" (an anagram of his own name) containing a series of wild imaginings, one of which must have appeared especially improbable to his contemporaries, although it has since been literally fulfilled. The hero of "Giphantie" is carried by a hurricane to a strange land where he is shown the method by which the native "genii" produced pictures. "You know," said the guide, "that rays of light reflected from different bodies form pictures, paint the image reflected on all polished surfaces, for example, on the retinæ of the eye, on water, and on glass. The spirits have sought to fix these fleeting images; they have made a subtle matter by means of which a picture is formed in the twinkling of an eye. They coat a piece of canvas with this matter, and place it in front of the object to be taken. The first effect of this cloth is similar to that of a mirror, but by means of its viscous nature the prepared canvas, as is not the case with the mirror, retains a facsimile of the image. The mirror represents images faithfully, but retains none; our canvas reflects them no less faithfully, but retains them all. This impression of the image is instantaneous. The canvas is then removed and deposited in a dark place. An hour later the impression is dry, and you have a picture the more precious in that no art can imitate its truthfulness.

After reading this very remarkable prophecy one can hardly help thinking that De la Roche must have conceived the idea after viewing the pictures shown with Porta's "dark chamber," a contrivance which was then, as we know, in vogue.—*Photographic Times.*

CAN PHOTOGRAPHY LIE?

BY J. HUBERT.*

I will try to analyse and see whether our beautiful art science can be put to such base use. I have an abhorrence for untruth, and hope to meet with your forbearance when I presume to occupy your time in a discourse to which I feel myself little able to do justice; I am nevertheless assured that you will excuse my shortcomings, and with this encouragement will try to expose the culprit, and, if I can, will endeavour to find an excuse for his shortcomings. Although entailing several digressions, I will adopt the easiest and most familiar way, and go through the operations with the genii of science to whom I have the honour to address myself.

My professional day breaks, but not my fast, therefore must do both to nerve myself for my exertions. Scarcely have I given my mind to this important *initium*, when I am bothered—no, honoured, I should say—with a gentleman whose duties in the City lay upon him the additional obligation to choose such an inconvenient hour for the laudable gratification of his desire to perpetuate his present appearance through my humble instrumentality. He enters with such airs as seem to be required for the occasion, makes the usual remarks about the suitability of the weather, informs me in the same breath that he can only grant me five minutes of his presence, tries to bind me down to finish a proof same day, and, this being found impossible, asks the earliest opportunity when I shall be able to do so; and three days hence being mentioned as the earliest possible date, informs me solemnly that that very evening being the time when he leaves town for a considerable period, hopes that he should not be disappointed, and, requesting me politely to make haste, follows me into the studio. He only wants a bust, but is not quite sure whether his legs should be appended thereto, but, yielding to my suggestion as to the impractibility of such a pose, leaves it entirely to me, which somewhat restores my hopes of settling a dispute with my inner man, who seems somewhat unreasonable just now. Alas! for human expectations; my sitter has altered his mind now, and wants a cabinet. Having exchanged plates, I emerge once more from my dark room, my inner man revolting all the while, but, suppressing the voice of the deep, effectually succeed in composing myself, the picture, and the man, who, not being very partial to the head-rest, indulges in strong epithets upon that already much-abused instrument. However, with heroic effort, I adjust, persuading him to grin and bear it. He objects to the one and submits to the other, and while he is listening to my sudden, incoherent talk, in which I make a desperate effort to count seconds at the same time, the trick is done (thanks to my pneumatic shutter), he protesting that he has moved, while I give him the contrary assurance. The young lady not having arrived yet, I cannot hand him over to her persuasive talent, so, on his hurried preparation to vanish, I have to leave development to handle the pen instead.

"Good morning! Afraid shall lose my train! Send the proof on."

"Beg pardon, but it is our rule to pay at time of sitting."

"Oh, must I pay a deposit?"

"No-o, that is not necessary; but, to save booking, confusion, &c., we prefer the whole amount."

"I leave my card. I have never before paid anywhere. I am a friend of the Lord Mayor's footman. You can inquire. It is monstrous! It is ——"

However, on my calm insisting upon payment, and finding no more answers to my arguments, he disburdens his conscience, and thinks, having to pay once, he may as well do it now. I think so too, and, hastening back to my coffee, I hope to get an opportunity to study my next sitter a little more, in order to accomplish my task of detecting the liar. Now, liars are not very candid, so I have to be vigilant. That I myself should have been guilty of that for which others are called to account by me matters little, for, according to ancient usage, it is not at all necessary to see the beam in one's own eye, but it is very desirable to expose the mote in the other. Now for another cup of coffee; another lump of sugar wanted. Whether it is coincidence or sarcasm, my wife responds with an assumed substitute in the shape of a fair lady sitter who, if she is innocently unaware of her sweetness, must be convinced of being a lump, for how could she be deaf to the groanings of my newly-mended posing chair? Exquisite subject, though, for my contemplation. This time the sitter is introduced to me in the stronghold of my labours—the studio—by my young lady assistant, who has the audacity to expand her arms insinuatingly in apparent imitation of the arithmetical rules of bulk. I have some difficulty in preserving my dignity and administering a visionary rebuke, which is, however, totally lost to the intended recipient by the interposing object of my operations. I bow politely, explaining away the lady's fears that she never makes a good photograph, beg of her to be at her ease,—in which kindly-meant suggestion I miss the mark, however, for, it being hot, she looks at me in astonishment, and, through the combined use of fan and handkerchief, leaves it not uncertain that she wants to convey to me that ease is out of the question. An additional headache is not considered a deterring circumstance, inasmuch as I am informed that the photograph has to be finished by her husband's birthday—which happy event would occur within three days—and, if it did not give entire satisfaction, I would, of course, give another sitting free of charge, finishing up with the earnest request to be represented in such a manner as not to exaggerate her form, which, though it could not be called thin, was decidedly not of such dimensions as would account for the extraordinary size by which she had been misrepresented by previous photographs. What a splendid chance for the embellishment of my subject!

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* Read before the London and Provincial Photographic Association.

"Head and shoulders? Yes, madam. Pray stand there."

"I hope you will not keep me long standing. Can I not sit? I sat always when I had a tooth extracted—I mean, had my photograph taken."

"No, madam. If I am to rightly represent your features" (I had nearly blundered out, "reduce your features") you must kindly stand. Turn a little, please. No, no; I want to show the front. You will excuse, but a slight turn imparts grace, when such is naturally present."

At this juncture I carry my point, and having introduced a longer focus lens into the camera, proceed to focus. If any little delay is occasioned by the changing of the lens, it is always advisable to display either all the scientific knowledge you possess, or so much of it as will suffice to fill up the interval. By so doing I nearly forgot to take cognizance that my fair sitter's hair, in colour, represented the very lowest strata of the spectrum, which fact obliges me to use a plentiful supply of powder. After having thus isochromised my subject, I draw most of my curtains to ensure the necessary reducing effect, which, to some little extent, a well arranged set of curtains can do if they have not been shifted too much or too little, give a full exposure, and, at the sitter's request, a glass of water and *Punch* (I mean, of course, the comic kind) to the sitter, and repair to my dark room, which, through the introduction of a single sheet of canary medium in place of the deep ruby red, has lost many of its horrors. I proceed to remove a burnt sienna backing (which, by the way, I procure from the nearest oil and colour shop, and apply to all my plates) by passing one hand to and fro under the plate, which I hold with the other under a stream of water; this proceeding has the additional advantage of soaking my plates. I then apply a developer,* which consists of the smallest quantity of pyro compatible with density, and of the highest permissible allowance of ammonia ·880, restrained with such minimum of bromide as will just prevent fogging. By this means I find out with tolerable certainty whether the exposure was correct shortly after immersing, and before it is too late to apply more of the restrainer, the immediate addition of which I think advisable in every case, when, upon the application of the developer, it becomes evident that the plate has not been under-exposed. When the first indication does not afford me sufficient clue as to the correctness of the exposure, I examine quickly by transmitted non-actinic light, which then, from the greater or lesser density, constitutes a sure guide. When I know or find my plate to be under-exposed I reject it at once; but in the exceptional case of not being able to take another negative, and suspecting under-exposure, I flood the negative first with a weak, unrestrained ammonia solution, and then apply the normal developer. By the help of artificial light (which, for dark-room illumination, I hold to be a *sine quâ non*) I am well able to control the density of my negatives to such an extent as to make the use of the intensifier an exception. Should I have to resort to one, I have a partiality to the one recommended by Monckhoven. As far as my own observations go this method seems to be permanent. I now rinse my negative, pass quickly through a salt bath to arrest osmotic action, wash well in a syphon—which holds my plates perpendicularly—fix in sodium thiosulphate (I scorn hyposulphite) wash well in a syphon, and dry my plates on pegs driven into the wall, very near the ceiling, just over the kitchen fire, or, if necessary, hasten this process by repeatedly flooding with methylated spirit.

Do not, however, imagine, Mr. Chairman and gentlemen, that I am so much wanting in courtesy as to keep my sitter waiting while I thus ruminate. No, no; even if my lively imagination had tempted me to that, it would have been of little avail, for before I have time to finish, tap, tap, tap, on my dark room door, a voice, "Is the focus a success?"

To which astounding display of amateur knowledge I can only faintly retort, "Yes, the focus is," and I added inaudibly, "but the focal length might have been still greater."

Examining the negative, however, I have cause to congratulate myself, for so far I behold the negative counterfeit of my fair sitter in such an aspect as only three years' exercise in a lady's modern drill class, aided by Madame Rachel, could possibly impart. My thoughts fly to the still more beautifying process of retouching, and overfilled with joyous anticipation of the resulting portrait, and noxious fumes nearly bursting the door open, I announce that the result is all that could be desired.

The lady's gracious parting remarks that if the portrait should please her she would recommend countless numbers of her lady friends whose focus coincided somewhat with her own, brought me back to my subject, and I began to wonder whether it was right to pencil an untruth to please a customer. I answered the question to my satisfaction in a very convenient way. I reasoned, firstly, that if a photographer placed a photographic instrument before a very stout sitter and took a negative copy therefrom without more ado, he should in all probability exaggerate his subject; that would be a lie of necessity, but also would undoubtedly be a financial failure if indulged in to a considerable extent: this failure would be inexcusable in the eyes of the world. If, on the other hand, with the aid of posing, lighting, swing back, long focus lens, and retouching, he could produce the other extreme, and did so, he would still be a liar, but his lie would be an excusable one, and, furthermore, would not be attended with commercial failure. But here the artist painter steps in, dictating to keep the truth, and the following dialogue is suggested to my imagination.

Photographer. So you would have me portray my sitter's individuality—faithfully represent character, not even minimise the stoutest form?

Artist. Yes, that only is true art.

P. Pray, sir, what would you do if your sitter dressed her hair in a totally different fashion to what she usually wears it, and twists and turns her mouth until all individuality is gone?

A. I should most assuredly suggest an alteration, and paint naturally from observation.

P. I could not do that, because I should not find it out until the portrait is finished. You may alter *ad libitum.* Your paint does not cost much, and you get £20 for your work; I get £1, and every alteration entails an outlay of several shillings. Moreover, you require several sittings; I have to do the work in one. You converse, conceive, and idealise, and perpetuate at once; I may converse, and conceive the ideal, but only wish that I may get it.

A. But, my dear sir, the instantaneous process.

P. Much of that is an exaggeration, as I think I can prove some of your work to be,

A. Do not add insult to injury.

P. I have no intention of doing so, but I can prove to you that you do not represent your subject truly at all times.

A. That is impossible. I study the character of my sitter, give a natural pose, light my subject well, foreshorten where necessary, and there you are!

P. Now if your subject is such as would be quite unpresentable in the truly natural state!

A. Oh, then I moderate it just a trifle to make it acceptable, you know!

P. I have caught you now. By your own words you prove, in a simple manner, what I meant to prove more elaborately. You have saved me that trouble.

A. Oh, you incorrigible! I will give you a little of my mind. I could never see that a photographer should be entitled to use the name "artist."

P. Well, I will explain that. An artist, with all the qualities inherent which make him so, will still have to learn the mechanical part of using brush and colour; he conceives the idea, he composes his subject, he idealises it, distributes lights, and reproduces the whole on canvas.

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* Since writing the above, I have become a convert to the potash developer for some plates, and soda developer for others.

A. Now, what does the artist phtographer do?

P. Why, up to the mechanical reproduction, he does the very same thing.

A. Well, my good friend, what happens then?

P. Why, then the photographer bears off the palm, for his genius has a still further task to accomplish. Every study or subject which has to be conjured up in thought only by the artist, will have to be produced and brought face to face with the camera, and very often needs training; and then, O! then, if the photographic paint would but take kindly to the paper! Alas! how much canvas—in the shape of dry plates—is spoiled before success rewards the effort!

(*To be continued.*)

ANATOMICAL PHOTO-MICROGRAPHY.

BY DR. J. WEST ROOSEVELT.*

The particular form of photo-micrographic apparatus which I have to introduce to attention is one intended for photographing anatomical and pathological specimens with high powers. It is a very easy thing to photograph almost any specimen, provided you use a low power lens, have a sufficient source of light, and a proper apparatus to work. With a high power lens, however, the problem is quite different.

Now it is necessary, in order to explain some of the difficulties, to give some idea of how specimens are prepared for the microscope. I refer now to specimens of an anatomical nature.

In the first place, we are obliged to use transmitted light. The specimens must be cut, and they usually are cut with a machine, and they must be cut so thin as to make them perfectly transparent. If you want to secure a good picture from your section, it is necessary that it shall be cut, at the most, about from a five-hundredth to a sixteen-hundredth of an inch in thickness.

The specimens are prepared, in the first place, by hardening in alcohol or in other fluid. Then they are mounted on slides of glass, and are covered with a very thin piece of glass on the other side. In order to fasten them on to the slide, we generally use Canada balsam or some similar cement. Now when this is done, inasmuch as the balsam penetrates every portion of the section, the entire detail of structure would be lost if we did not adopt some way of bringing it out. In order to show the detail then, we stain the specimens. We use some dye-stuff which stains the different portions and brings out those little details which would be entirely hidden if they were put in perfectly transparent balsam. For this purpose a good many stains are used, and this is the first trouble, or one of the first troubles, that one has to deal with in taking microscopic photographs of such subjects. The most satisfactory stain for general use—the one that brings out the details the best—is, first, logwood, which stains certain portions of the tissues only, namely, the small nuclei of the cells, a very dark purple.

Logwood, when properly used, only stains those nuclei, and it stains nothing else, consequently that brings out a certain amount of detail. In order to bring out the rest of the detail, it is necessary to use a counter-stain of some kind, something that will stain the rest of the tissues. For this purpose the most satisfactory stain is one called eosine. This gives a deep dark red. To the naked eye the specimen thus stained looks entirely red. Under the microscope the dark purple of the nuclei cells comes out perfectly distinct as a dark purple, and the rest shows as a red.

For some kind of tissues that stain is entirely unsatisfactory, and here it is necessary to use other colours, as, for example, in these specimens, which are designed to show the fibres of the nervous system, it is necessary here to stain in a peculiar way, first, with the logwood stain, then with the ferrocyanide of patassium, and the result of this is what is called a double stain. The ferrocyanide selects certain portions only of the tissues, and the logwood selects certain other portions, and the result is a staining which gives you in some part a deep purple, and in other parts a sort of an orange-yellow.

In the study of bacteria—the source of so many of our diseases—it is necessary to use a great many different stains. We use a deep red stain produced by the colour fuschine, and a violet stain produced by methyl violet, and a brown stain. These are the commonest stains employed. Under certain circumstances several of the stains have got to be used, each one of those bearing necessarily upon the procedure for successful photography. Of course, red is an extremely unsatisfactory colour to photograph by direct light, at least so I am told by my photographic friends. I do not know anything about it myself. With transmitted light, red produced by eosine photographs very satisfactorily. It gives an extremely satisfactorily sharp negative, and it brings out the details pretty well. I suppose that the reason of this is that practically, with this method of photography by transmitted light, you are in the same position that you are in when you undertake to enlarge a negative. The light is behind your picture, and as red is a colour which acts slightly, it works quite satisfactorily.

I was told when I first began to photograph that this was not so, but by far the most satisfactory results that I obtained on high powers were out of the common red stain. There [indicating] is a photograph to 350 diameters, showing the cellular structure of some organs. The details have come out perfetly distinct. The stain is red. After working for a while with those stains of red and deep purple, I tried certain others, and here I have a specimen of the spinal cord cut in a thin section, double stained with logwood and with the ferrocyanide of potassium. This is produced on the ground glass, and it makes quite a beautiful picture. The contrast is very distinct, and the details appear to be very good. Unfortunately the yellow happens to be somewhat of an orange colour, and the result is that there is no contrast between the slides.

Here [indicating] is a photograph of 150 diameters an expert (one who knew much about the enlargement of the spinal cord) would recognize very easily. It was taken with a slide stained as this one is, but the orange and the dark purple act with exactly the same intensity on the plates, but it produced no contrast at all.

In special specimens of bacteria it is necessary to use a violet. Now to overcome the difficulties produced by violet and some other stains, it is necessary to use between the lantern and slide some contrast colour. Undoubtedly it would be best to use a prism which would throw the mono-chromatic light on your object. Such a prism is very expensive. A simpler way of accomplishing the same end is to make a glass cell which shall fit between the light and your object, and which you can fill with fluids of any different colour you desire. This cell, it must be borne in mind, should not be very thick. If you are photographing a blue, the most satisfactory colour to make as a contrast to it is a yellow, a yellow which shades well on to the orange. You can tell that you have got the right colour by looking on the ground glass. When the blue image on the ground glass becomes black, you know that you have secured the complementary colour of exactly the shade you desire. So much for those details.

Now this machine [referring to his camera] which I beg to call your attention to, is not original with me at all, except in some of its details. It is the same idea that has been used a great many times before. An ordinary microscopic-photographic apparatus differs from this, in the first place, in having the lens fastened to the camera, and in having the stage which carries the object moved, so as to get the focus. Now with high powers such an arrangement is bad. It is very difficult to make that stage move evenly. Unless you have a very heavy metal slate for the end of the camera, you cannotget a steady bed for the lens; and for this work absolute steadiness is necessary, because the difference of being in focus and out of focus with a $\frac{1}{15}$ lens, such as I have in my hand, which will give 1,000 to 2,500 diameters, is the difference of less than $\frac{1}{10000}$ inch.

In regard to the source of light, the most convenient is the calcium. The sunlight, of course, gives the best light which a person can have for this work, but after that comes the calcium light. The calcium light, however, is oftentimes troublesome. An ordinary kerosene lamp may be used. The best one that I have experimented with is the duplex or triplex. The circular burner lamps are not satisfactory, for the reason that, although they give a great deal of light around the room generally, you get but very little light when you have to take it from one side. The best kerosene lamp has a wide wick, and the wick should be set edgewise to your lens. This [pointing] is a triplex lamp that came from Europe. It gives a very satisfactory light. To increase the light it is very advisable to have a condenser. The first condenser is situated here in this apparatus. It is a $4\frac{1}{2}$ inch double plano-convex lens with the convex sides set against one another. Now, with low powers, that is all the light you need. The concentration is sufficient.

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* Read before the Society of Amateur Photographers of New York.

Below the stage you have some such apparatus as this [indicating] for the camera, the diaphragm. The diaphragms are of different sizes. Very small ones are sometimes required. For high power work another and peculiar condenser is to be recommended. This is the Abbé illuminator, so called from its inventor.

This condensor, when used without a diaphragm, gives light from the centre and also from all sides. It is inserted close up under the slide. It intensifies—possibly I can show you how much—the light. You see it makes a very brilliant light. The result of the rays of light coming from below and the sides is that every structural detail of the image is abolished, and you get no shadows. Whatever colours you have are shown there on the slide. The colour image is all you see. There are no shadows from any point, because the light strikes from every side, and does away with the shadow. Now for our use we use this condenser, and put in a very small diaphragm behind it. This cuts out the side rays, and gives an image which I believe it is impossible to get with any other apparatus. With the diaphragm the shadows reappear, and we have a structure as well as a colour-image. This apparatus is only to be used with high powers.

I had this microscope made, and it was made with a special purpose. I have not very much time to study photography, and it is very necessary for me to have everything work immediately and surely; therefore, I had the microscope constructed especially by Grunow, and it has a very accurate adjustment. It also has the peculiarity of being able to turn on its stand. That is a convenience in searching for objects, and you can find what you want to take very easily; and so I can turn the microscope and throw the mirror below it, and look through it the same as through any ordinary microscope. The microscope has a very short, wide tube. This wheel [indicating] gives me the coarse adjustment. In fine adjustment, and working with high power, I have the ordinary screw apparatus working against a spring. In order to get that where I need it, it is necessary to get around the edge of the camera, and it is necessary to have a rod coming back to the rear of the box. This rod I have had a universal joint put on, so that it will fit in this way [indicating], and attach itself to the fine adjustment. This works perfectly well; I know that it works well, because I have successfully photographed at powers of 1,200 diameters.

[The speaker then manipulated the rod from the back of the camera, which rotated the fine adjusting screw.]

Now for the details of the photography itself. I won't trouble you very much with these. I use either the lens itself directly without an eye-piece, or with one. There is a lens which I have found most satisfactory for this apparatus; it is a Zeiss D D lens, and it gives, with the camera drawn out to its full extent, about 300 to 350 diameters. When you don't use the eye-piece, you are troubled in a peculiar way. These lenses magnify very highly. The consequence is, if the light leaves the lens at a pretty obtuse angle, and strikes the side of the tube, it produces a reflection from the side of the same that will blur every picture. Now, as long as you can see the light reflected from the tube like that [indicating], you will have a blurred picture. In order to overcome the reflection in as convenient and rapid a way as possible, I had this little apparatus made, and attached to the microscope. I screw this in the place where the eye-piece belongs, and then I have diaphragms of different sizes that will fit in there, and I use the largest ones. That cuts out the entire reflex light from the sides of the tube. The picture will be blurred if, from the end of the camera box, you can see any reflex from the side of the tube. With a very high power, it is necessary to use a diaphragm as small as this [indicating] to get a clear image.

Now, as to the camera box. First, I will say that in my house I have the box and the microscope so that the microscope will swing right into line. The camera is also secured fast to a well-seasoned board. When I am ready to take a picture, and have found the object that I want to take, I remove the eye-piece, or, for some work, leave it in, and I turn the instrument around, and then I take this velvet curtain (this is a very primitive apparatus). I use an old piece of string, and tie around. That will cut out the light absolutely between the camera and microscope which does not pass through the lens.

Now to get my rays focussed, I use a hand mirror, and simply put it here [indicating just above the ground glass of camera], and focus as well as I can with the coarse adjustment, moving this [indicating] as may be necessary, and when I get it as nearly in focus as I can, I put this rod on and I go around to the rear end of the camera box and then focus it accurately with the rod. That is the apparatus.

I use instantaneous tropical plates. When I started this work originally, I found that the emulsions that they furnished on a large number of plates worked very satisfactorily, and therefore I have continued to use them. I do not know anything about whether they are better or worse than other plates for this work. They are extremely rapid plates. I have got to judge as to the amount of exposure, and I do so simply by experience. With a piece of red tissue and with the present lens of the magnifying power of about one hundred diameters, I should expose one of those instantaneous plates two and a half minutes, provided my light was good. With this D lens and a magnifying power of 350 diameters I have exposed the plates from seven to nine minutes, depending on the exact colour of the section. With the 18th thousand immersion lens, and a magnifying power of 1,000 diameters, or more, the exposure must vary from twenty minutes at the shortest up to two and a half hour at the longest. The exposure also must depend on the light, and the sensitiveness of your plate, and the stain used. With the yellow light that we get from kerosene, and the diaphragm as small as possible, I have had sometimes to expose as long as two and a half hours. The results were in some ways satisfactory.

Photo-micrography, as applied to these anatomical and pathological specimens, is distinctly useful. By means of it details may appear which you cannot see with the eye. Here is a print [showing a picture] of certain bacteria which cause disease among guinea pigs and mice. It has not only been possible to photograph bacteria like that, but it has been possible to photograph the details of them that the eye could not see at all. For example, there is one which has a peculiar kind of motion. It was thought that that motion must be due to a movable flagella or tail. No one could ever demonstrate that tail until Dr. Koch, of Berlin, succeeded in photographing it.

There is one detail that a gentleman asks, and that is how to uncap this machine. When you are using high power and have little light, no cap is necessary. If the exposure is twenty minutes, the amount of difference of exposure left in drawing up the slide would amount to very little. When I have short exposures I simply take a visiting card and drop it in like that [indicating], and then I draw the slide and take the card away suddenly for the required time and replace it. That is all that is necessary to be done.

I would like to call your attention to one other thing. The photographing of one single object with almost any amount of magnifying power is a very easy thing to do. A good lens will do it without much difficulty. I have some photographs that belonged to my father—photographs of single diatoms—and they are very beautiful. In photographing here we are trying to get a field of as much as 8 by 10 inches in some cases, and that makes quite a different problem from the old ones.

It is quite as instructive to show you some failures as it is to show you some successes. There [indicating] is a spoiled plate—a plate that was spoiled by the reflex light from the inside of the microscopic tube. That was in perfect focus, but I did not notice my diaphragm, and you see the whole side is blurred, and the middle is also blurred.

(Dr. Roosevelt exhibited several other interesting specimen plates which were examined with interest.]

Notes.

Platinotype prints are not really injured by sulphuretted hydrogen, the paper basis being alone yellowed, if we are to judge by the following from Chapman Jones, a scientist well qualified to throw light on the question. He says:—"Concerning the action of sulphides on platinum prints, I enclose a waste print exposed in parts for forty-eight hours to sulphuretted hydrogen, sulphide of ammonium, and sulphuretted hydrogen in water. The paper seems a little yellowed, though scarcely to an injurious extent. Hydrochloric acid does not seem to affect the yellow much, but weak chlorine water restores the original whiteness without apparently injuring the colour or depth of the print. I have not seen Pringle's statements, but to use the word 'fade' in any connection with the slight change of colour of the paper, or to therefore cast any suspicion upon the 'permanency' of the prints, seems to me altogether unreasonable."

A bust portrait of himself is to be presented to President Glaisher, who has so long filled the chair of the Photographic Society. The bust we have not seen, but the fact that it is the work of Albert Toft is sufficient guarantee that it is what it should be. The presentation is to take place at the Holborn Restaurant on Monday evening, the 31st instant, tickets for the dinner being obtainable at 5s. each, from W. S. Bird, 74, New Oxford Street.

A meeting of Philadelphia photographers recently held, says the *Photographic Times*, has passed this resolution: "That this meeting recommend to the Eastman Dry-Plate and Film Company to advance their price-list to the public on plain bromide prints, one hundred per cent." What does this mean? Was the meeting held in the interest of plate makers who think the paper likely to be a dangerous rival to glass, or does the word "public" apply only to amateurs? Surely the Philadelphia photographers do not want to pay more for their materials than they are doing now.

The *Photographisches Archiv*, in referring to A. S. Herschel's recent outburst of anger at being called Herschell, calls attention to the variations which the names of its own readers and contributors undergo in foreign countries. Anschütz became "Auschuetz," and also "Aushnety" in America, and Jaschütz in Belgium; while Abbe and Schott (of Jena) became Abby and Scott, also Abney and Schott. Mallman and Scolik was converted into Mollman and Scholik, and in the course of reprinting, Zenger has become Tenger; Tellmann, Tellymann; Miethe, Miettre; Schober, Scober; and Schüren, Schurer.

The already wearisome Russo-Bulgarian dispute has been temporarily relieved by the publication of an amusing photographic skit aimed at the peripatetic delegates who, after vainly stumping Europe, are now on their way back to Sofia. The skit gives in the first place the faces of Messrs. Grekoff, Katchkeff, and Stoiloff, as they appear in their ordinary photographs, and then follow a series of views depicting the gradual lengthening of the trio's faces as they find out at Vienna, Berlin, London, and Paris the increasingly small chances of Bulgaria getting any material help. Starting with genuine photographs, the likenesses have been preserved throughout the subsequent caricatured portraits with considerable skill, until a climax so really droll is reached, that in spite of the evidently pro-Russian origin of the skit, it is causing general amusement at the *cafés* of Sophia and Tirnovo.

It is said that the Civil Service Commission intends to require each candidate for the Government service to send in his photograph with the other papers now required, with a view to using it, should he subsequently pass, for his identification; for there are rumours about to the effect that the candidate who passes the examination is not always identical with the clerk who subsequently enters on the clerkship which the examination has secured. In other words, it is suggested that there is such a thing as passing an examination by deputy.

The Photographic Convention of the United Kingdom (we do not mean the Conference which is to be held under the auspices of the Camera Club on February 8th) has at least one notable feature, and this is an immense amount of committee power.

The Convention was established last year, and met at Derby in August, something over fifty being present; but it is quite possible the membership roll (subscribers of five shillings) may have been somewhat ahead of the attendance. This year the meeting is to be at Glasgow, and a few days ago we received a circular upon which no less than seventy names figure under the head of local committee, and by our report (an official notice received from the secretary) on p. 46, it will be seen that the number of local committeemen nominated is only two short of a hundred. In addition to this, we have a General Council of thirty-one, and our report refers to future formation of four sub-committees.

We wish the Convention success and progress, yet if all the proposed committeemen and council become subscribing members, we imagine that the promoters will be well satisfied with the results of their work.

"An Amateur" writes from a western town, and protests that the commercialist is allowed a liberty to lie, which is unfairly denied to the amateur. To illustrate his position, he tells his story as follows.

"I exposed some plates upon an ancient building in my neighbourhood, and obtained negatives which I considered exceptionally good; indeed, the prints from them were distinctly better that those sold by Mr. X., the leading professional photographer in the town. Now, the printer in the employment of Mr. X. makes prints for me when I want more copies than I can find time to make myself, and he printed for me from the negatives in question."

Our correspondent continues:—"Mr. X. is going around and telling my friends that I did not really take the photographs myself, but that he did an important portion of the work; this latter statement being absolutely untrue, as he was out of the country when the prints were made by one of the men whom he employs."

"Now my position is this," our correspondent continues: "I made my own negatives, but employed another person to make the prints, while the professional photographer in question constantly claims an authorship in photographs, although he has taken no part in producing them—in fact, he seldom does any work in the establishment that bears his name. Even the general management is in the hands of a paid servant, and I doubt whether the so-called photographer can either make a negative or a print."

Perhaps some casuist can help our correspondent.

Home news brought to us from abroad is a most marvellous article. The latest photographic importation about ourselves is given by the *Scientific American*, which gravely states the detective pocket camera in the shape of a watch is to be patronised by the authorities at Scotland Yard, who have decided to make extensive use of it. A detective who wishes to secure the portrait of a suspected character will only have to get close to his subject and pretend to pull out his watch and look at the time, and the features will be registered. This is all very well as a supposition, and as such may be accepted ; but when our contemporary goes on to mention that for the sake of experiment accurate likenesses were taken of a large number of the persons who mixed in the crowd at the recent socialists' meeting, we must take leave to doubt.

Some time ago we drew attention to the fact that with the introduction of dry plates the liability of studios to take fire was enormously reduced. When collodion was used, Insurance Offices had some ground for charging an extra premium ; but now that inflammable materials are banished, a studio is no more likely to take fire than an ordinary room. Yet the insurance on a photographic studio is just as high as in the old days. A correspondent who has interviewed the London and County Office on the subject, sends us a communication which is opportune, since it appears that no action has ever been taken in the matter by photographers. He writes : "After paying for some years thirty shillings per annum insurance on a house and studio of the estimated value of £600, it occurred to me that as the studio had not been used for photographic purposes for quite two years, it was time the extra risk was reduced. I approached the London and County Fire Office on the subject, and I am bound to say they at once admitted the reasonableness of my demand. The result of the application was a reduction from one pound ten to nine shillings—a difference so considerable that I was tempted to make a few inquiries concerning the insurance of photographic studios."

"The conversation was something to this effect. I said : 'Are you aware that the introduction of dry plates has made the photographic studio as safe as any other building ?' 'We are aware there has been a change,' was the reply of the official. 'Well,' I observed, 'now that explosive materials are no longer used, ought there not to be a reduction in the premium ? Why should a charge for an extra risk be made when there is no extra risk ?' 'Our charges are the same as they have always been.' 'Perhaps no representations on the subject have ever been made to you by photographers ?' 'No, we have had no complaints.' And so the interview ended. Of course the Insurance Offices cannot be blamed for keeping up the old rates. Their business is not to note the growth of photography, but simply to calculate the chances of fire to a photographic studio, based upon the actual number of fires which have occurred at photographic establishments. And certainly if photographers do not trouble themselves, why should the offices ? Nor am I sure that the latter will willingly admit the difference between collodion and gelatine. 'Are there no photographic chemicals now used in the studio?' asked the clerk of me. There was, I thought, some significance in the question. Evidently, in the opinion of an insurance official, no distinction exists between one kind of photographic chemical and another. Therefore I fancy the Insurance Offices will need convincing. But this is a task to which I hope photographers are quite equal."

From our correspondent's letter, it is very clear tha nothing will be done until photographers themselves do it. Nor does it seem as if any individual action would be of much use. It needs combination, and combination among professional photographers is difficult to obtain. However, the matter is worth consideration, because in these hard times no saving of expense is to be despised. In some cases the charge arising from this extra risk must be very considerable, because the percentage is based upon the value of the whole premises, and not upon the value of the studio. We are, of course, speaking of cases where the studio is attached to a house. Where the studio is detached, the difference between ordinary and extra risk can be but trifling. It is, however, certain with the majority of photographers that the insurance must form a very heavy item of expenditure. A few particulars from our readers as to their experience would be instructive and useful.

According to one of the many contributors of gossip relative to the late Earl of Iddesleigh, photography did the deceased nobleman a good turn when he went to Washington to settle the Alabama claims. All the Commissioners, with the exception of Sir Stafford Northcote, were non-sporting men, and utter was their dismay when a Maryland country gentleman brought his hounds and a bagged fox to Washington, with a view to affording the British Commissioners an opportunity of riding across country. Sir Stafford saved their credit by accepting the invitation, and fully sustained the reputation he had gained as an athlete through the exhibition of a photograph of himself and his colleagues. It appears that every third or fourth window in Washington was decorated with an immense photograph of the five British Commissioners. In the foreground sat Sir Stafford Northcote with his legs crossed, and with an extraordinarily thick sole upon the boot which stood out in the picture. At the ponderous thickness of Sir Stafford's boots the Washingtonians were never tired of gazing with undisguised wonder. Americans detesting pedestrianism were struck with wonder at the walking powers of Sir Stafford implied by these enormous boots, and such expressions as "Why, each of those soles must have cost a dollar and a half !" were heard to issue from many lips. Therefore, after seeing Sir Stafford's boots, no one was surprised to find he was an excellent horseman. But one is tempted to ask how much credit was due to the boots, and how much to the photographer. Even so recently as 1871, when the Alabama treaty was signed, photographers were inclined to look indulgently upon the Brobdignagian boots —invariably the result of the cross-legged position. We are strongly disposed to give the photographer, in this nstance, the benefit of the doubt.

If it be true that public companies have no souls, neither have trustee-landlords. It will hardly be believed that the managers of a large estate in the very heart of London can exercise so much authority over their tenants as to prohibit their placing a brass plate on their doors or railings to announce their profession. In the case we have in view the tenant is an artist, who finds photography so useful an adjunct to painting that he contemplates uniting the two. His landlords have not the slightest objection to his building a studio at the back of his house, because, of course, it would add to the value of their property ; but he must not put a plate on his door to tell the public he is a photographer, although he does not propose to make any show. The reason is, that the plate would detract from the "respectability" of the street, and lessen the value of the adjoining houses! How absurd this plea is may be gathered when we say that the street in question is a gaunt dingy thoroughfare, at one time boasting of wealthy residents, but now decayed, mostly inhabited by lodging-house keepers, and possesses a public-house and a green-grocer's shop!

Rebiew.

Harmonious Colouring as applied to Photographs. Fourteenth edition. Price one shilling. (*J. Newman, 24, Soho Square, W.*)

Here we have a new edition of an old and standard book ; and all we need say is, that the revision has been brought well up to date.

NEGATIVE FILMS.

BY SURGEON-GENERAL J. L. RANKING.*

The inconvenience attending the use of glass—especially when plates of the larger sizes are used in the field—and also that attaching to the storage of large plates, owing to their weight and bulk, and the necessity for a heavy battery of plate-boxes, are now fully recognized ; but the advantages of paper over glass are, by many, held to be more than counterbalanced by certain disadvantages and drawbacks, the more prominent of which are (1), the comparative slowness of printing from them, and the consequent necessity for rendering them translucent by some process or another ; (2) the presence of so-called grain in the finished print ; and (3) the difficulty of stretching paper sufficiently flat, except by the use of the expansion "roll-holder," or "roller dark slides." Many years ago, in 1857, while serving in Burmah, I took up the calotype process under the tuition of the late Colonel Greenlaw, of the Madras Army, a name which may be remembered by some, since he introduced a modification of the calotype process, which, after him, was called the Greenlaw process. The excellent results he obtained, both on plain and waxed paper, led me to anticipate that the gelatino-bromide papers of the present day might yield equally satisfactory results. This anticipation has, I think, been realised, the negative papers of Morgan and Kidd, and Eastman and Co., under proper management, giving most satisfactory results.

In 1883, I ventured to predict a very promising future for those amateurs who, deterred by the cumbersome and costly equipment necessary to dry-plate work upon any large scale, might yet desire to take up the charming recreation of photography. The plate for instantaneous or "drop-shutter" work, and paper for still subjects and calm weather, I ventured to predict, would constitute the work of the amateur in the future. I think I may claim that I was not altogether out in my surmise. There appeared to me no reason why emulsion spread on paper should not be as rapid as on glass. This also has been realised, as drop-shutter pictures are now taken upon paper. The absence of those conditions which govern what is known as "halation" give paper an advantage which no backing of glass plates can equal.

But, while giving attention to paper as a substitute for glass, I watched with much interest the attempts made to put into the market translucent, or more or less transparent, films, calculated to supersede paper, to do away with the troublesome and more or less messy manipulations necessary to give paper negatives such a measure of translucency, as to facilitate printing, and, at the same time, to veil or hide the grain of the paper.

I purpose making a few remarks upon Warnerke's tissue, Thebaut's card films, Pumphrey's flexible glass, and the Woodbury tissue, all of which I have worked with more or less success.

And, first, *Warnerke's tissue*—first premising that I would wish any defects to be attributed to my faulty manipulation rather than to any necessary defects in the films themselves—I would first draw attention to the texture of the films, irrespective of their photographic properties.

Envelope A contains specimens of each of these films, which have simply been "fixed," without exposure to light. After removal from the hypo bath, they have been washed, then passed through the alum bath, again washed, finally put for one minute in methylated alcohol, and then dried. They present very marked contrast as to structure and transparency. Warnerke film cannot be termed transparent, besides which it has a manifest "texture." Thebaut's film is transparent, but has a very slight milky opacity. It also expands very considerably under the influence of moisture, recovering it largely on being passed into the alcohol bath. It is "textureless."

Pumphrey's film is, as its name, "flexible glass," implies, still more transparent, quite "structureless," and has a consistance or toughness that does not apply to either of the others. The Woodbury tissue does not equal either of the others ; it is less translucent, can lay no claim to transparency at all, and is streaky and patchy. It is firm in consistence. These different qualities of these several films must necessarily, and, in fact, do, affect the pictures taken upon them, though these are further modified by the character of the emulsions spread upon them.

Upon Warneke's films I have never got very satisfactory negatives. The films, after development and fixing, in the majority of instances, have shown minute pin-point or pin-head blisters, which show during development, and this, whether pyro and ammonia or pyro and soda be used. Specimen A No. 1, negative of a snow scene, shows the spotted character resulting from the drying of the small blisters. That these form between the layers of which the film is built up is, I think, proved by the fact that while the film is wet they can be pressed out between the finger and thumb, or made to coalesce into larger blisters. The specimen is a favourable one than otherwise.

Thebaut's Films (envelope B).—Very satisfactory results may be obtained upon these card films, while the cardboard support is convenient for use in the camera. They are slow, and require patient development, and this to be carried to the fullest extent, till the picture is not only veiled, but quite lost to view by reflected light, otherwise the resulting negative will be found poor and thin from want of density. The objection to them is their thin expansion, necessitating their being carried through all the processes, and even dried upon their cardboard support.

Messrs. Addenbrook and Ince, in a paper published sone time ago, pointed out that this might be obviated by stripping the films, and passing them through a bath of methylated spirits, and this is certainly the case. The fixing of these films is, so long as they remain attached to the card, a long process. The manufacturer says half an hour, but I have found an hour insufficient in a bath of the usual strength. If stripped after development, they fix quickly. After washing, the alcohol bath restores them very nearly to their original size. Their price has probably militated against their general adoption. Certainly, I have read no notice of them, except the article just referred to. The mounted glass B is a transparency on one of these films from a drop-shutter negative.

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* Abstract of a paper read before the Camera Club.

Pumphrey's Flexible Glass Films.—For rapidity, facility of development, transparency of film, and resulting picture I give a decided preference for these films over any others I have tried. Envelope C contains a few negatives taken upon them, while the film enclosed between glass (also labelled C) contains other specimens of negatives and a transparency. I think it will be admitted that they have a brightness and "sparkle" not belonging to the other films. But for the price these films would, I think, have a great demand.

The Woodbury Tissue.—This tissue was introduced with such a flourish of trumpets, that I was disappointed at the results I was able to obtain. I have never obtained a negative to be compared with those I have secured upon any of the films I have referred to. This arises from the difficulty of preventing air-bells forming upon the films, from the consequent unequal action of the developer, and from the faulty nature of the tissue itself, as shown in the specimen of the simply cleared tissue exhibited. The specimen between glass plates marked D (those also in the envelope) are as favourable specimens of work upon this tissue as I can exhibit. Possibly, the fault lies with myself. I have certainly seen better results, but there are difficulties in reaching them which do not pertain to other films. But that lessons are learnt as often from failure as success, I should have hesitated to show these negatives on Woodbury tissue. Until films can be put into the market at prices approaching those charged for paper, and considering the degree of excellence attainable upon the latter, I do not think they will come into general use. Three shillings for a dozen quarter-plate size sheets is a high price, and when one comes to work upon 12 by 10 sheets almost prohibitive.

While on the subject of films, I may be permitted to say a word about film-carriers or stretchers. The "roll-holder" and "roller dark slides" are expensive articles of equipment when used for 10 by 8 or 12 by 10 sizes; and, besides, have other disadvantages. Eastman's carriers, although excellent for small sizes, don't answer for the larger; the paper does not lie flat; while those prepared by an adhesive material, spread upon wood or vulcanite, are objectionable; for I have found that paper affixed to them, if left in the slide more than twenty-four hours, is apt to adhere so closely that it cannot be removed without tearing; and also that the material itself permeates the paper to some degree, and influences the clean development of the picture. I now use a carrier or stretcher made of two pieces of board (well seasoned wood), hinged together with leather, and the free ends furnished with pin-points. The paper being laid down, sensitized surface downwards, upon a clean sheet of blotting paper, the "stretcher" is opened and laid upon it—about half-an-inch of the paper is allowed at either end as an over-lap. These, being pressed down upon the pin-points, are held fast, and the board being then brought together, there is no fear of the paper slipping, but it is stretched quite flat and taut. I have brought one quarter-plate size for inspection, but I use the same for 12 by 10 sheets, purchasing the paper in the roll. There is yet a future for paper in the way of applying the process of orthochromacy to it. Messrs. Dixon and Co.'s orthochromatic plates are a great success, and fully come up to what they profess to do—viz., to render the gradation of shades or tints of colours better than ordinary plates do, at the same time that there is no loss of rapidity. If the process can be applied, as doubtless it can be, to paper without any very great advance upon existing prices, paper will have a still more promising future before it.

Patent Intelligence.

Applications for Letters Patent.

541. James Ashford, 179, Aston Road, Birmingham, for "Improvements in photographic cameras."—13th January, 1887.

638. John Williams, 115, Albert Road, Aston, Birmingham, for "Improvements in photographic cameras."—15th January, 1887.

725. Leyson Thomas Merry, 46, Lincoln's Inn Fields, London, W.C., for "An appliance for use when changing or transferring photographic dry plates into dark slides."—17th January, 1887.

742. Louis Jacques Henri Cellerier, 9 and 10, Southampton Buildings, W.C., for "Improvements in the production of coloured photographs."—17th January, 1887.

Specifications Published during the Week.

2423. Arthur Rayment, of 36, Beatrice Road, Finsbury Park, in the county of Middlesex, Optician, for "Improvements in the stands or supports for photographic cameras."—Dated November 19th, 1886.

The claim is:—

1. The improved arrangement and construction of the top of a tripod or other stand for a photographic camera, the two parts thereof being hinged together and acting in conjunction with a revolving screw.

2. The improved construction of the top of a tripod or other support or stand for a photographic camera by forming the top in two parts hinged or jointed together.

2390. Felix Joseph Vergara, of Lordship Lane, Dulwich, in the county of Surrey, Gentleman, for "Improvements in holders or carriers for flexible material sensitive to light, for the purpose of taking photographic pictures."—Dated February 18th, 1886.

This invention relates to the Vergara slide which has already been described in the Photographic News. The claims are:—

1. The method of making the sensitive film holder so that the film upon either side of the central slide may be exposed in the camera.

2. The method of using the sensitive film by folding it over the central slide before inserting the slide in the holder.

2670. John Edward Thornton, of New Lorne Street, Moss Side, Manchester, in the county of Lancaster, Printer, for "Improvements in the formation and construction of photographic cameras."—Dated November 20th, 1886.

The claims are:—

1st. In a photographic camera, the combination with a front board of a revolving panel to which two or more lenses are affixed.

2nd. The method of attaching the fork carrying the front board of a photographic camera to angular side sliding plates, by means of flat springs.

3rd. In the extension frame of a photographic camera, the use of a rack or racks with teeth formed on their upper and lower edges, and in combination therewith the bottom pinion and the extension pinion, actuating the angular side sliding plates carrying fork, stretchers, and front board.

4th. The method of placing the pinions attached to base-board, or extension frame, or sliding plates out of gear with racks.

5th. In a photographic camera, the use of any flexible translucent material, such as goldbeater's skin, paper prepared with varnish or gelatine, parchment, or other similar flexible material, for focussing purposes in lieu of the ordinary ground glass.

6th. For the purpose of carrying the flexible translucent material for focussing screen, and for obtaining the requisite tension on said screen the use of a spring roller attached to camera body.

Patents Granted in America.

354,534. Edward S. Butler, Wyoming, Ohio, "Process of and apparatus for printing vignettes."—Filed June 26, 1886. (No model.)

Claim.—1. The process of making vignettes by continually changing the angle at which the light falls on to the negative through the opening of the piece used for forming the boundary of the vignette-picture.

2. The process of making vignettes, consisting of imparting to the negative, the piece having the vignette-opening, and the thing to be printed, an undulatory or tilting motion and a rotating movement.

3. In a printing and vignetting device, the combination of the plate or holder G, and means for imparting to the holder a tilting or waving movement.

4. In a printing and vignetting device, the combination of the plate or holder G, and the plate having the uneven surface, and the roller I, revolving round the stem or axis of the plate G.

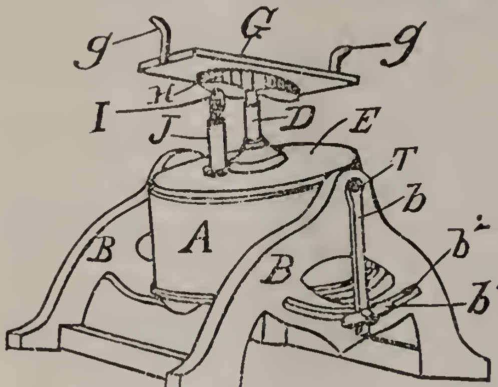
5. In a printing and vignetting device, the combination of the plate or holder G, and the plate having the depressions W and projections V on its under surface, and the roller I, and spring for holding the roller against the said uneven surface of the adjacent plate.

6. In a printing and vignetting device the combination of the plate G, and the plate H, formed in alternate depressions and

projections, and the roller I, hollow cylinder J, rod *l*, and spring K.

7. In a printing and vignetting device, the combination of the plate G, provided with a cam surface and roller I, and the stem D, and ball-and-socket joint and the roller I, and rotatable plate F.

8. In a printing and vignetting device, the combination of the rotatable plate or support E, suitable clock-work for moving it, roller I, and plate G, cam-surface H, stem D, and pivotal joint or connection.



9. In a printing and vignetting device, the combination of the rotatable support E, wheel F, plate E, clock-work, roller I, spring, plate G, stem D, cam-surface, and pivotal joint or connection.

10. In a printing and vignetting device, the combination of the plate G, stem D, means for tilting and rotating the said plate, and the ball-and-socket joint and the rotatable sleeve S.

11. In a printing and vignetting device, the box or frame A, journals T, frame B, rotatable part E, stem D, roller I, plate G, with cam H, and pivotal joint.

12. In a printing and vignetting device, the box or frame A, journals T, frame B, arm *b*, and clamp *b'*, rotatable part E, stem D, roller I, plate G, with cam H, and pivotal joint.

COMPOSITION IN PHOTOGRAPHIC PICTURES.

BY J. WELLS CHAMPNEY.*

The question of composition is one that concerns the amateur photographer the moment he first directs his lens towards any scene in nature.

He may not, it is true, be permitted, as the professional artist, to introduce clouds at will, to lop off trees to suit his ideal, or to elevate mountains. He must accept the present scene with its special lighting and arrangement; picturesque it may be, or painfully common-place. The common-place commends itself often for other than pictorial charms, and the amateur must not ignore these.

To-night, however, I wish to consider whether there may not be some principles of composition, exemplified by pictures thrown upon the screen, which can be clearly stated.

These principles faithfully followed can aid in raising photography to recognition as an art, and the amateur photographer, by the intelligent use of the camera, may produce results which shall rank well with the master-pieces of landscape. He has the right of choice, and by his exercise of that right shows how far he is gifted in an artistic sense.

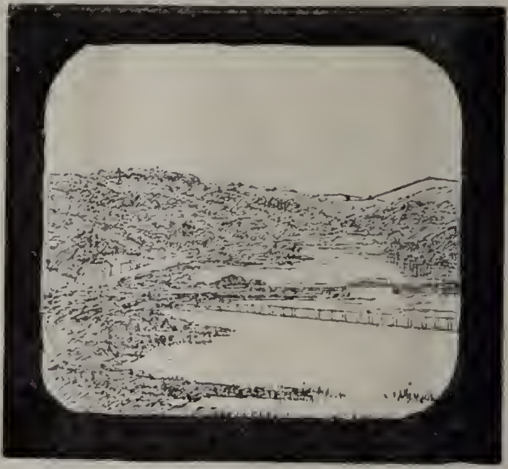
It has always seemed to me that too much attention has been given to considering what may not be, rather than to profiting by what we have.

One of the principal points I wish to make to-night is, the need for a wiser choice in the shapes of our pictures, and, to make the argument clear to your eyes, and through them to your minds, I have prepared mats for a dozen transparencies, and will throw the picture upon the screen, as it has already been shown here, and then cut off such parts of it as seem to me foreign to the full enjoyment of the subject. This will be very likely to lead—as I wish it to—to an argument, one side of which I shall be ready to support. So far as I know, this subject has not received much attention, and our lantern slides are generally made as large as the plate will permit. I hold that if the part of the subject that is really of interest should be no larger than a dime, all the rest of the plate had best be covered with opaque paper, that we may fully enjoy it; that the relation of subject to the shape of the opening through which it is supposed to be seen, whether circle, or oval, triangular or parallelogram, should receive the careful attention of all.

* * * * * *

Following the reading of his remarks, Mr. Champney spoke substantially as follows, while the pictures were being exhibited on the screen.

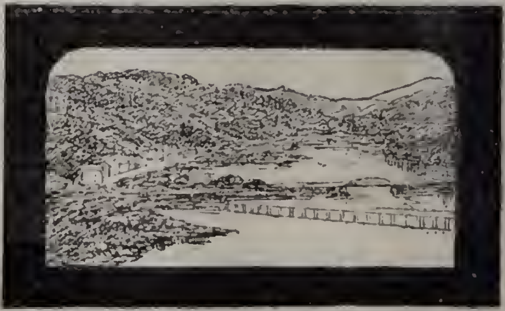
Doubtless these various points that I want to make to-night are open to discussion, and though I use one shape, you might very readily say that it would be more advantageous to use another; but in my efforts this evening there shall be shown a general purpose in each of the shapes of these mats, and I think I can give reasons for altering the shapes of the various pictures which I propose to show upon the screen.



[Mr. Champney then threw a mountain-lake scene upon the screen.]

That, then, is the view as it is mounted. It is on a 3¼ by 4 slide (regulation size). It is certainly a very beautiful photograph, and has everything to commend it except it seems to me we are in doubt whether to look up or down. The repetition of the form in the reflection, however clear and beautiful, is to me less interesting than the mountain. The reason is that there is an unpleasant confusion of things.

Now I will place a mat over this [indicating]. There is a special object for cutting off this sky. I hold that a mat which cuts the sky in that way [indicating] lets you see and enjoy the beautiful gradations of the photograph far better than you could with the area of white in your eye.



[Mr. Champney then changed the picture as shown above.]

That dark line above gives the mountains, by contrast, an ærial quality they did not possess before. I have already altered the foreground, because we want to give in such a picture as that the idea that we are looking from a height. When looking from a height downwards, you are interested, as a rule, more in the various forms of the earth than you are in the sky, and whatever reason an artist might have to make this change, a photographer has a double reason, because, as a general rule, in his pictures the skies are perfectly white.

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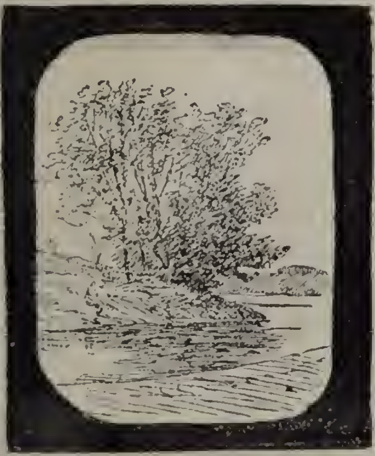
* Read before the Society of Amateur Photographers of New York.

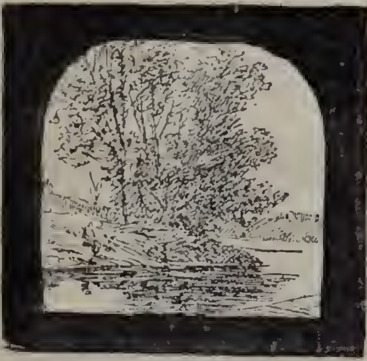
The point I wish to make in this special picture is the change necessary in all our pictures where so large a portion is white sky. It was not my purpose in showing this to make it a perfect composition, but simply to call attention to the delicacy that is brought to our eyes in the backgrounds of such pictures by having near them the clearly defined dark line.

Now in that [referring to another picture of a cabin scene with little children present] it is merely a question of cutting off your foreground. Losing a little above and a great deal below, gives you an interest in the picture that you had not before. The whole object of making these mats is that we should present on our plates that which calls attention to the special subject, whatever that subject may be, whether it is the distance of the mountains, or the flatness of the earth, or the peculiarity of the plain, or the human interest of a group.



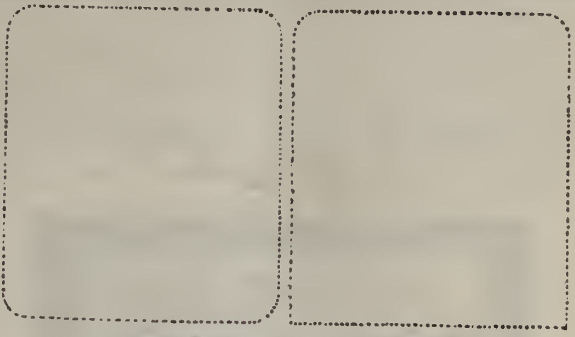
[Mr. Champney then threw upon the screen a water scene with two men fishing on the bank as shown above.]

Now that certainly is very charming, and to me it is simply hypercriticism to alter it. The present shape is evidently well thought out, but at the same time I have one point to call your attention to, and that is this: if we are to be in any way interested in the figures, then the outline of the trees above is very annoying. Again, this mass of white sky and water in front seems to be harmful.



Now I place this mat in the position [as shown above] to let one of the trees go out of my picture, and I cut the line of the other tree, forming a charming silhouette. Placing it that way the doubling of the man forces your attention to the human interest in the picture itself. Now I will draw it out and you can see if it does not centre better with the mat than without Are not we disturbed frequently with the double curve of the conventional lantern slide mat? Is it not wiser to adopt this angle below to contrast with the curve above, and should not the curve above bear a certain relation to it?

Where does our work differ from that of the thoughtless, except in the way of presenting a scene after we have learned to photograph and to choose a subject, and, after we are familiar with the various chemical processes, so that our works hold their own as productions of merit? What is it that distinguishes one work from another if it is not our mental action; our method of presenting the subject; our ability to perceive its merits and demerits?



Conventional Mat. Artistic Mat.

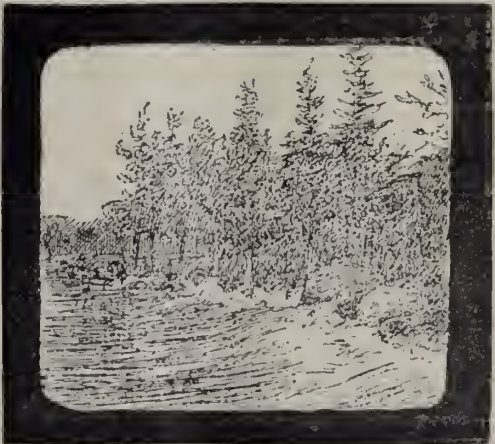
Now there is another scene. By cutting it off in this way you will see that the change makes a very material differerence in the appearance of the picture.

[Showing a bridge scene over a river.]

Now in this picture we cut off the top and the bottom there [indicating]. That which you see at the top of the picture is a very distressing element, because it forces attention and comes against the mass of white, and you cannot enjoy it as you could if the mat were placed in another position. I also feel that our attention and interest are attracted too much by this mass of foliage below, so let us cut it off and see.

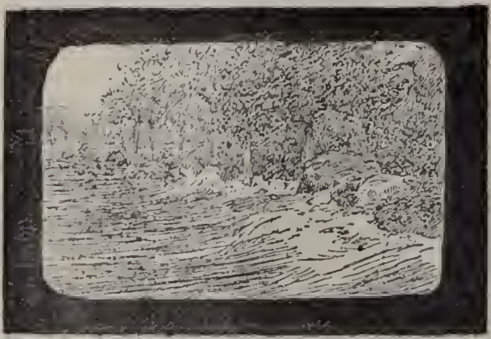
This will give me an opportunity to remark upon another element in landscape composition. I will draw that back a moment, calling your attention first to a repetition of the straight line not quite in the centre of the picture, and to the left-hand pier of the bridge, and the reflection of the mass of foliage carrying your eye down in a straight line, cutting the picture in two. You will see my object and reason for covering up much of the foreground. It is in order that we shall get a varied line near that portion of the scene where the eye naturally falls.

Now push it until the proportion on one side of the bridge is more than the other—there, say. Now why there rather than further on? Because the outline of the foliage as it is cut off by the mat on the right or left had better, as a rule, be higher on one side. Now I will draw the mat back and let you see it in this position, and see whether we agree as to the question of choice in presenting the view. [Changing mat.] Now, that is far better. That is charming. The position, the balance, the mass of black, the amount of white, the silhouetting of the trees against the white, the gradations of half-tints throughout the picture are very beautiful, yet possibly there is a little too much interest in the foregound. I think that will gain by cutting. [Here Mr. Champney placed the mat so as to cut off a

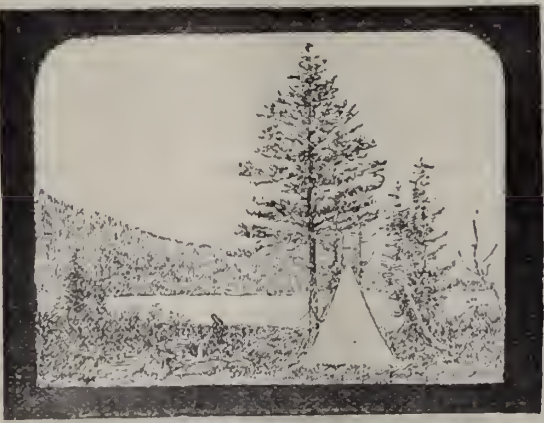


piece of the foreground.] I will cut off a little piece of this foreground, which is very interesting as a foreground, but too interesting to give value to the picture. Now that gives what pleases most, a sense of liquidity in the water, and a beautiful perspective throughout the entire picture.

Here is a picture about which a gentleman spoke to me a few moments ago, and said he could not choose any other place, so that we are not going to criticise the place on which he stood. Following out the thought of one of the pictures previously shown, what is there in that picture which interests us? To me it is the washing up of the water against the rocks. The silhouetting of the trees against the sky proves to me a disturbing element, the beauty of the wave being interfered with.



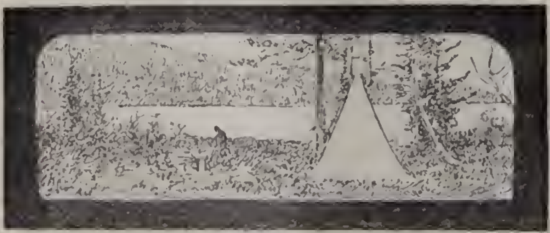
If it is cut off in that way, as shown above, it is much better. You see how quickly the eye goes to that which seems to me to make the picture worth taking.



[Mr. Champney then showed a picture of a tent on the shore of a lake, as above.]

Mr. Champney—That is one of the California scenes by an amateur, who has furnished our society a dozen or twenty very beautiful scenes. From the stand-point of composition the repetition of the form of the tent and of the tree above is an element of ugliness, no matter whether the tree is very beautiful and very perfect, or not.

I think it would be better to cut off the top of that picture.



[Mat was then placed over the picture, producing the above effect.]

(To be continued.)

Proceedings of Societies.

London and Provincial Photographic Association

A meeting of this Society was held on Thursday, the 13th inst., when A. H. Harman presided. Permanency of the Platinotype printing process formed the principal subject for discussion. Although no feature of novelty was divulged, some of the remarks of F. W. Edwards are worthy of attention. This gentleman, who has had a large experience with the process, and showed several examples of his work, attributes a good many cases of discoloration to a reducing action set up in the paper when prints are exposed to light, after development, and before the soluble salts are expunged by means of the acid clearing bath. He further pointed out that an accumulation in the latter of iron salt was also a fruitful source of yellowing in lights. Seeing that so many positives are now made in platinotype, he was of opinion that if Pringle's contention held good—viz., an atmosphere impregnated with sulphuretted hydrogen would cause fading of the platinum image—then the sooner it became known among photographers the better. He did not think the print experimented upon could have been properly prepared, therefore if anyone present believed they could destroy the prints handed round they were welcome to try, and he would undertake to restore them provided the paper support remained intact. By this he did not mean he could make an old yellow print white. The offer was accepted.

Several minor questions having been answered, it was announced that at an early date Mr. Edwards would give a demonstration of the process before the Society.

A short discussion followed on the permanency of bromide prints, in which the Chairman upheld the view, long ago expressed by Sutton and other able chemists, that developed prints are more stable than those obtained by direct action, and, under fair conditions, might be regarded as permanent.

Attention was also drawn to an article by Dr. Liesegang, on collodio-chloride transfers for the lantern, enlarging, or direct positives. D. Hubert promised a demonstration of the process shortly. Briefly stated, a talced glass plate receives a thick coating of silver citro-chloride in collodion, and is printed by contact in the usual way, toned, fixed, and washed. Thickly gummed paper is used for transferring, and the gum, being readily soluble, admits of the images being attached to a 10 per cent. gelatinised paper for positives, and to glass when diapositives are required; variation in the depth of printing being made to suit the style of positive desired.

The Photographic Convention of the United Kingdom.

The Local Committee held their first meeting at the Religious Institution Rooms, Glasgow, on 13th January, when John Stuart was unanimously elected chairman of the Local Committee.

The Local Secretary reported that ninety-eight gentlemen had been nominated as members of the Local Committee by the Glasgow members of the Executive, in pursuance of the power accorded to them by the meeting of Council held in London on 14th October last, and that, by the number who had intimated acceptance of the appointment, the Local Committee consisted of seventy members—forty-two professional, and twenty eight amateur.

The Chairman explained fully the purpose of the Convention, and pledged himself to do all that lay in his power to make the Convention of 1887 a notable success. He called upon the members of Committee to make such preparations and arrangements as would ensure the comfort of, and give pleasure to, the visitors and friends who would come from all parts of the United Kingdom to the Convention meeting at Glasgow in July. The heartiness with which the Chairman's remarks were received showed that the members of Committee were quite prepared to give a cordial welcome to all the friends who might come. The Chairman proposed the names of members to form four sub-committees to undertake the necessary labour, these sub-committees to be called reception committee, exhibition committee, excursion committee, and entertainment committee. The Chairman's proposals were adopted by the meeting.

Cheltenham Photographic Society.

The monthly meeting was held on the 13th inst. This was a lantern evening, E. Wethered, F.G.S., presiding at the lantern.

Slides were exhibited by the following members :—General Dawson, on his own bromide plates ; Mr. Bertram, on Pumphrey's lantern plates ; Mr. Joyner, on Cowan's chloride plates ; Mr. Ball, on chloride plates ; Mr. Jones, various ; Mr. Wethered, photo-micrographs, &c , on chloride plates. There were also shown a number of slides sent by Mr. Pumphrey, as specimens of his new lantern plates.

The amateurs had succeeded best with the chloride plates, many of their bromide slides failing in vigour and constrast. This difficulty had been overcome by Mr. Pumphrey with his own plates.

Leicester and Leicestershire Photographic Society.

The annual meeting for election of officers and exhibition of lantern slides by members was held in the Old Town Hall on the 12th inst. There was an excellent attendance of members and ladies. The minutes of last meeting having been read and confirmed, and one member proposed, the election of officers was proceeded with, resulting as follows :—

President—Geo. Bankart. *Vice-President*—C. Underwood.
Treasurer—K. Sculthorp.
Committee—Messrs. Foller, Sculthorp, Tucker, and Broadhead.
Hon. Sec.—H. Pickering, High Cross Street.

The accounts were then presented, showing a balance of nearly £5 in hand.

The lantern exhibition then commenced, Messrs. T. S. and W. Taylor, and members of the Society, working their biunial lime-light lantern on an eighteen-feet screen, which was admirably managed, and gave brilliant pictures, and brought out the slides in a very efficient manner.

Where all are good, it is invidious to particularize ; but the slides of Messrs. Tucker and Wethered were excellent, and left nothing to be desired. There were slides exhibited also by Messrs. Broadhead, Taylor, Underwood, Alsop, illustrating the various modes of development and exposure. The best slides of the evening were those reduced from whole-plate to lantern size. Hearty thanks were given to Messrs. Taylor for their kindness in working the lantern.

Yorkshire College Photographic Club.

The second annual exhibition of lantern slides by this Society was held on Friday, the 14th inst., in the Chemical Lecture Theatre at the College. There was a very large attendance of members and their friends, and the lantern was manipulated by the **President** (C. H. Bothamley) and the **Secretary** (Harry B. Hall). About 140 slides were shown, the contributors being Mrs. J. Knight, Miss S. Knight, Rev. R. W. Atkinson, Dr. E. H. Jacob, C. H. Bothamley, A. Cooper, H. B. Hall, H. Ingle, P. Lund, A. E. Nichols, and W. Thomas. The subjects included landscapes from various parts of the British Isles and Europe, together with a number of figure and animal studies. All the slides were prepared on gelatine plates (chloride or bromide) from gelatine negatives. The finest exhibit was a series of views in Norway, by the Rev. R. W. Atkinson, which had been reduced in the camera on gelatino-chloride plates from 7½ by 5 negatives.

Birmingham Photographic Society.

The first meeting of this session was held at the Technical Schools, Bridge Street, on the 13th inst., E. **Howard Jaques** in the chair. W. Wiley was elected a member.

B. **Karleese** exhibited a dozen photographs executed by G. M. Elton, the eminent photographer of New York, from pictures exhibited by Mr. Elton in the National Competition, and for which he received prizes.

W. D. **Welford** passed round some snow scenes taken by himself during the present month, the results being such as to show what can be done in picture making even at this season by watching the favourable opportunity.

The recently formed Lantern Section occupied the remainder of the evening in demonstrations of transparency-making for the lantern.

E. C. **Middleton** took up the wet collodion method, with the various operations from cleaning the plate to the exhibition in the lantern, showing the transparency before toning, and the result afterwards. Magnesium light was used for the exposure.

W. D. **Welford** then followed with the production from dry plates, and, exposing several of Pumphrey's new plates to gas light, showed the simplicity of the work and the almost impossibility of failure. During the day he had exposed thirty plates, the exposure ranging, according to quality of negative, from thirty seconds to two minutes in the camera. He prefers copying in the camera to contact copying, finds slow development best, and uses Beach's potash developer same as for negatives, gives good exposure, and uses a small quantity of citric acid in the hypo fixing solution.

R. P. **Taylor** gave his demonstration with Cowan's chloro-bromide plates, using the ferrous oxalate and the ferrous citro-oxalate developers. The copying was done by contact, and resulted very successfully, particularly a sea view from a negative by Mr. Welford.

A. **Pumphrey** contributed a paper on "Printing Lantern Pictures by Artificial Light from Various Sizes of Negatives." This we hope to give particulars of, with illustration, in a future issue.

Sheffield Photographic Society.

The ordinary monthly meeting was held at Freemasons Hall, on Tuesday, January 4th, Mr. **Hadfield**, Vice-President, in the chair. C. F. Longden was elected a member. Arrangements were made to have a *conversazione*, including optical lantern and exhibition of members' work, during February.

A. S. **Platts** then read a paper on "Woodbury Tissue," practically illustrating the process, and developed several negatives.

Dr. **Morton** remarked that in using films or flexible supports generally, there appeared a little difficulty in securing a flat, rigid surface during exposure and development ; and in printing, the least variation produced distortion. Glass in the ordinary gelatino-bromide plate met these requirements perfectly, the only drawback being its weight and fragile nature.

Mr. **Hibbert** exhibited a number of excellent prints by the Eastman Company which were much admired.

The Society intend having a lantern slide competition at their next meeting.

Cardiff Amateur Photographic Society.

The monthly meeting was held on Friday, the 14th inst., the President, S. W. **Allen**, in the chair.

J. Austin and Geo. Shepton were elected ordinary members.

The **President** regretted that through a pressing engagement, Mr. Kellar's lecture must be deferred until a future meeting.

In connection with the jubilee year, he had much pleasure in proposing that an exhibition be held some time in the autumn, and he trusted that the members would make a point of securing some good pictures, so that a perfect record of the town and neighbourhood at this interesting epoch might be handed down to posterity.

Birkenhead Photographic Association.

The first ordinary meeting was held on January 13th, at the Free Public Library, J. **Alexander Forrest** in the chair, with a large attendance of members.

Edward H. Higgins was elected a member.

A hearty vote of thanks was given to P. H. Phillips for the more than ordinary amount of trouble he had taken to pilot the Association during the past year, after which the new Secretary (Mr. G. A. Carruthers) was formally introduced to the meeting.

Mr. **Forrest** then read an address for the new year, and was listened to with much interest.

A resolution was passed that in future all prints sent in for competition shall become the property of the Association.

Dr. G. A. **Kenyon**, Medical Officer of Health for Chester, showed a specimen negative taken on a stripped film and mounted on glass, which, although taken under very adverse circumstances, was much admired when shown through the lantern.

The *pièce de résistance* of the evening was an exhibition by Frederick Evans with his new double oxyhydrogen lantern of nearly a hundred slides made by him from negatives taken during a six months' holiday in New Zealand, &c., last summer, and comprising shipping, landscapes, natives, animals, &c. Some exquisite views of the White and Pink Terraces were greatly admired, as were several of the geysers and boiling mud wells ; and as a large tract of this part of the country has since been devastated by earthquake, the views had a more than ordinary interest. The room not allowing of the usual sheet being put up, Mr. Phillips had arranged a very excellent substitute—a piece of drawing paper about six by eight feet square, such as is used by architects, and can be bought up to any length, he had mounted on two light wood rollers; this arrangement can be hung almost anywhere, and, with a small weight of any sort tied to the bottom, it hangs as flat as can be desired, gives a splendid picture, and has the great advantage of portability.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE usual monthly meeting was held on Tuesday evening, the 14th inst., in the Royal College of Science, Dublin; HOWARD GRUBB, F.R.S., Vice-President, in the chair.

After the minutes of the previous meeting had been read and confirmed, C. H. Meldon exhibited an enlarging apparatus which he had had constructed. The apparatus consisted of a lantern which was adapted for using the lime-light, and was fitted with a pair of 8-inch condensers, in front of which was a carrier for holding the negative (a half plate). On the same baseboard as the lantern was a sliding piece with an upright in which the lens was screwed. The apparatus was so constructed that it was capable of reducing as well as enlarging, so that a lantern transparency or an enlargement could be made from the same negative. Mr. Meldon mentioned that, as a matter of practice, he had to keep the lime-light as low as possible, as otherwise there was great difficulty in regulating the exposure, as it became a matter of very few seconds. He also mentioned a circumstance for which he sought an explanation; namely, that in using a stop of a smaller size than about $\frac{f}{12}$ he could not get a sharp picture by any focussing. Mr. Meldon's apparatus was not covered between the negative and the lens, and he said that he did not find it necessary to do so.

J. L. ROBINSON said that in his experience an oil lamp was superior to the lime light for enlarging.

The CHAIRMAN said that in his opinion the difficulty of the stop was entirely caused by the condenser.

J. V. Robinson, on the part of Mr. Richard Robinson, exhibited Tylar's patent metal dark slide, and also a collection of most beautiful prints on Eastman paper.

The members afterwards adjourned to another room, where the Society's lantern was lighted, and a number of transparencies sent by Mr. Pumphrey, of Birmingham, as specimens of a new gelatine plate which he has brought out, were passed through the lantern.

The following gentlemen were elected members of the Society:—Julian George Butler, Louis Meldon, Thos. Mayne, jun., and William Lawrence.

CAMERA CLUB.

ON the 13th inst., discussion on the subject of Negative Films" was reopened by an address from Surgeon-General J. L. Ranking (see page 42).

After the lecture, W. TOMLINSON exhibited an interesting series of paper negatives taken by himself in America in 1886, also bromide paper prints from the negatives.

W. A. GREENE referred to grain in paper negatives and lantern slides from them, as proving much more troublesome in most cases than Surgeon-General Ranking had found it. It was understood that grain appeared, unless the film was just correctly exposed. In regard to the Woodbury tissue, it seemed that the new and improved make would not give the defects referred to by the lecturer.

Mr. SPIERS showed a convenient book of oiled sheets arranged alphabetically, for storing paper negatives. He had found red stains come upon oiled paper negatives after ironing.

Mr. HARRIS said that the red spot on certain tissues was a silver spot, and could be discharged by cyanide; it was not oxidation, or ammonia would discharge it.

Mr. WALKER gave an interesting account of the preparation of paper and stripping-films, and stated that paper contained in itself the elements of failure, as no calendering or pressure would entirely remove the marks of the matrix made upon the substance of the paper when it was in the pulp stage. This led to the introduction of stripping-films, and even in these the paper support, which was of the purest kind and specially made, had to be coated with a soluble substratum which was calendered down, and the matrix pressed down, before being rendered insoluble with chrome-alum and made ready for further treatment. Without calendering, the stripped film would be as grainy as the worst paper negatives. In regard to the development of the stripping-films, there was no difficulty. Mr. Walker explained fully the newly-introduced use of collodion instead of the india-rubber solution, a change which made the processes more expeditious, cleanly, and certain. The gelatine backing was made with one surface smooth, and the other of a ground character.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting will take place next Tuesday at 8 p.m., at 5, Pall Mall East, when the subject of "Orthochromatic Plates" will be discussed, and results shown.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.—Applications for space at the forthcoming Exhibition of Photographs should be made to the Secretary, Exhibition, Newcastle-on-Tyne, on or before the 31st inst., and, to save time, 5s. (the entrance fee) may be enclosed.

PHOTOGRAPHIC CLUB.—On January 26 will be held the exhibition meeting of work done by the members during the past summer. Photographs must be sent in to the Hotel, addressed to the Hon. Sec., some time before four o'clock p.m. on the day of exhibition.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

DR. SINCLAIR.—It is very good of you to send us the prints; they are very interesting, and you have been remarkably successful in your aim.

H. GEARY.—There is much to be said on both sides. If we were to give a mere abstract of the conditions referred to by our correspondents, the replies might be misleading to others; while, to give our correspondents' letters in full would often be unfair to them, to say nothing of the large amount of space which would be occupied. Considering everything, we are inclined to think that the usual course is the best one as regards this matter.

F. STANDRIDGE.—As far as we know, there is no ground whatever for your supposition.

A. E. S.—There is, we believe, a means of colouring exploited by someone named Cellerier; but we have not heard of a method of photographing in colours by this inventor. Of the Company we know nothing.

GEO. B. SYMONDS.—The matter resolves itself into a question of fact whether the painter has done his work reasonably well, and no opinion can be formed on this point unless the original and copy are seen. Probably the price paid would enter into the question as to what is to be considered "reasonably well," as one would expect more from an artist charging £50 than from one undertaking an enlargement painted in oils at such a price as five or six guineas. Probably your only way will be to submit the whole case to an art expert, and, in case of proceedings, bring him as your witness.

BIOPHANTASCOPE.—Remove the varnish by the cautious use of alcohol, and then treat with a weak solution of potassium cyanide.

O. H. E.—1 and 2. It does not ordinarily form a ruby liquid, and we do not know of any way of making it ruby coloured. Why do you wish it to be ruby coloured? 3. You must use the clear liquid, carefully poured off from any deposit. If, however, you have a sufficient excess of acid, there is never more than a trifling amount of deposit.

ARCHITECT.—Apply to the Photographic Printing Co., 62, Basinghall Street, E.C.

OLD READER.—Some plates reverse more readily than others. Your exposure was insufficient; try four times as long.

RANDOLPH.—It is owing to a general diffusion of light arising from the numerous reflecting surfaces. If you carefully line the mount with black velvet, and rub the edges of the lenses with a mixture of starch-paste and lamp-black, you may palliate the evil. You must use a small stop.

J. S. & SON.—Any further particulars should come from the author of the photograph.

C. A. M. W.—It seems to us that your window should be quite satisfactory, especially as your conveniently-arranged shutter makes it so easy for you to reduce the amount of light on bright days. Bear in mind that the colours of the materials used gradually fade. Renewal once a year will probably be sufficient.

R. GUTHRIE.—We will try to obtain the information for you.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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MAKING INTAGLIO COPPER PLATES BY THE ETCHING PROCESS.

In our issue of Feb. 1st, 1884*, we briefly described M. Klic's process for intaglio-etched plates, and we are now in a position to give working details of a similar process.

In examining any of Fox-Talbot's helio-engravings one cannot fail to observe the similarity they possess to the half-tone photo-engravings which are so plentiful at the present time; indeed, if we make use of a transfer of bichromated gelatine as a basis for our operations, instead of the photogenic coating employed by Talbot, and afterwards proceed exactly as described by him, we shall attain similar results.

In the first place, take a hammered copper-plate with a highly polished surface, and clean it with levigated whiting and caustic soda applied with a rag; rinse under the tap, and if the water runs off in patches it is pretty certain that some of the oil used in the polishing process still remains, therefore the operation of cleaning must be renewed (a mixture of powdered charcoal and magnesia moistened with methylated spirits on a piece of flannel may be used), and then a final rinse with water. It is absolutely necessary to repeat these operations until the water flows evenly over the surface. The graining or aqua-tint ground can be applied over the developed picture, using, of course, an easily fusible resin, or the resin camphor and chloroform as described by Talbot, or the plates may be kept in stock ready "grained," for which purpose the method of Delechamps will be the most suitable. In the *Photographische Correspondenz* Dr. Eder gives a description of the latter method, asphalt being employed instead of resin, and a box revolving on an axis being the form mostly in vogue according to the doctor's article. To make such a one, get a well-seasoned wooden box about 4 feet high, dovetailed and joined without crevices, including the top, which must be made a fixture; the internal dimensions of the bottom must be large enough to carry the largest-sized plate required to be etched, and the inside had better be French polished or papered with a surface glazed paper. At one of the sides close to the bottom make a narrow door hinged to the bottom of the box. It should be framed and panelled to prevent its warping.

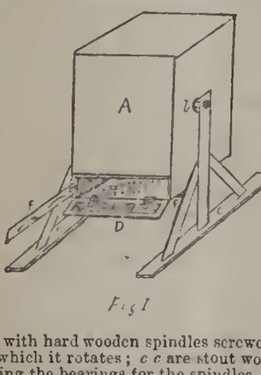

Fig I

A, aqua-tint box with hard wooden spindles screwed into its sides at *b b*, to serve as axis on which it rotates; *c c* are stout wooden trestles fixed to the floor, and carrying the bearings for the spindles. D is the door, E the pressure bar with spring, and at F is a bolt to lock the box in an upright position.

To insure the operator from being "powdered," nail strips of sheet rubber round the inside of the door, so that it will shut up nearly hermetically; using a bar with a stout spring or screw to close it as in a copying frame, then a few double-pointed nails driven into the base upon which the powder is settling will complete the affair, with the exception of the axis, which will be better understood from the accompanying cut (fig. 1).

A quantity of finely-powdered asphalt or resin having been placed in the box the door is closed tightly, and it is turned over two or three times to shake up the powder. After the lapse of a minute or two, to allow the coarser particles to settle down, the door is opened and a previously cleaned plate is placed therein, poised on the points of the nails (which should project one inch from the bottom and all be equal in height) and the door closed. Shoot the bolt F to keep the apparatus steady, after having revolved it.

The degree of granulation is entirely in the hands of the operator, as the longer the plate remains in the box the greater will be the quantity of powder deposited, and the finer will be the resulting grain, as there will be less surface exposed to the action of the mordant.

Carefully remove the plate from the box, and clamp one corner of it between a small hand-vice provided with a wooden handle, then hold it with the reverse side in contact with the flame of a spirit lamp or a Fletcher's low combustion burner, moving it about all the time, until the dull appearance of the resin changes to a glossy coat; but on no account should the heat be carried too far, as in that

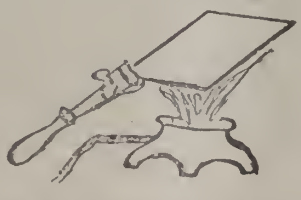

Fig 2

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* The first notice made was in the *Photographische Mittheilungen*, December, 1883.

case the resin would burn. On the other hand, if it is not melted sufficiently, it will wash off during the developing manipulations.

If we are not mistaken, Fox Talbot generally used albumen diapositives, such as those sold by Soullier Ferrier and Co., but very fine pictures can now be made by the carbon process.

Major Volkmar and Herr Sommers have explained* that a pigment tissue, made with a very soluble gelatine and a large proportion of sugar, produces the best results, as it gives a very slight relief.

The *Photographische Mittarbeiter*† published the following details, which we produce at length :—"We prefer to take the diapositive autotype tissue, No. 108, and proceed thus: A perfectly clean sheet of plate glass is coated with a very dilute solution of asphalt in benzole, and afterwards dried in the light. The pigment paper is taken from the bichromate bath and squeezed on to the coating of asphalt, and the superfluous solution removed with a cloth, then it is allowed to dry spontaneously. After complete desiccation of the tissue it is stripped from the glass, and the surface freed from the varnish by means of a soft rag moistened with benzole. After the thorough evaporation of the benzole, expose under the negative, as usual, not forgetting the safe-edge.

To transfer, we use plates that have received a preliminary coating of the following, and allowed to dry spontaneously:—

Gelatine	20 parts
Acetic acid	300 „
Chrome alum	11 „
Water	200 „

Dissolve and mix both solutions, then filter for use. The print is squeegeed on to the plate, and after the lapse of twenty minutes developed in warm water (90° F.), then rinsed in cold water, and finally laid face upwards for five minutes in a dish of spirit. This latter deserves especial notice, as by its use the sharpness of the positive is greatly enhanced. When dry, carefully retouch with a black lead pencil, and put a safe edge round it of tin-foil, or non-actinic paper. Now, instead of pouring a solution of bichromated gelatine over the copper, a ready-exposed pigment negative is developed thereon.

The above journal explains that pigment tissue (according to Herr Sommers one prepared with the admixture of a small quantity of albumen and some carbonate of magnesia) is sensitized in a 2-2½ per cent. of bichromate of ammonia, and exposed under the diapositive in order to produce a negative, and brought in contact under water with a copper plate previously coated as described; pass the squegee once or twice over it, and dry with a towel. At the expiration of twenty minutes the plate with the adhering tissue is laid face uppermost in a dish of warm water 90° to 93° F., in which the picture (a negative, as already explained) is developed. Rinse in cold water and stand up to dry, then take an ivory-pointed ruling-pen and draw a line round the picture with asphalt or resist varnish; afterwards go over the margin of the plate with a brush dipped in the same varnish, to prevent it being attacked should any of the etching solution get on to it. As soon as the varnish is set, a "wall" of bordering wax, about 1½ inch from the picture all round, is placed just the same as for aqua-forte work.

To make bordering wax, take the ingredients of either of the following receipts, and melt them together in a glazed earthenware pipkin.

1.—Yellow beeswax	2 parts
Resin	3 „
Olive oil	½ „
2.—Beeswax	1 „
Burgundy pitch	2 „
Tallow	1 „

When the ingredients for the wax are thoroughly incorporated, pour into cold water; while it is cooling, work the mass well with the hands, as the more it is kneaded the better it will be for use.

A sufficiently large piece of wax for surrounding the work in hand is placed in warm water until it becomes pliable; then pull and roll it out to about half an inch in thickness, slightly grease the points of the thumb and forefinger of each hand with mutton fat, press the roll of wax flat, and then make one of the edges to adhere to the plate all round the picture, forming a kind of dish (fig. 3).

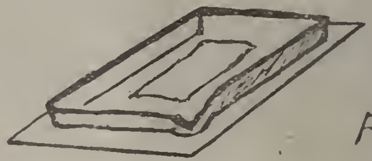
Fig 3

Before pouring the etching fluid therein, hold it up against a strong light to see that there are no interstices where the mordant could run out from under the wax border.

Etching the Plate.—Fox Talbot prepared his own etching solution, thereby insuring its being neutral. According to his description, "red oxide of iron is dissolved in muriatic acid, by the aid of heat, to saturation, and filtered. Upon cooling, a brown, crystallized mass is the result."

In *Dingler's Polytechnic Journal* for 1857, the following formula was given for preparing chloride of iron for etching purposes :—"Thin strips of sheet iron are dissolved in hydrochloric acid at the ordinary temperature. To the dark, greenish-brown fluid thus obtained, add a solution of chlorate of potassium in boiling water until it changes to a pale-ale colour, and gives a reddish-brown precipitate upon the addition of strong liquor of ammonia. If, in dissolving, the iron hydrochloric acid has not been used in excess, then the solution will change to a reddish-brown pasty mass upon the addition of the chlorate of potassium. In this case add strong acid, and use heat until all is dissolved and the solution is perfectly clear. This solution can be used over and over again, as its properties do not seem to be impaired, even after its contamination with copper. It is advisable to carry out the whole operation in the open air, as very deleterious gases are given off on the addition of the potassium chlorate."

Three solutions of different consistencies were prepared by Talbot: No. 1, saturated solution; No. 2, six parts of No. 1 to one part of water; and No. 3, equal parts of water and No. 1. Generally, solution No. 2 was employed, moving it over the surface with a camel-hair brush; in about a minute the etching began, commencing in the more exposed parts, and gradually distributing its action over the whole picture, so that, in two or three minutes, the whole process was finished. If distant hills or other weak portions were not brought out by No. 2, then they were etched separately with a brush dipped into solution No. 3; this, however, must be used with great care, as its action is very energetic. Solution No. 1, although its action is inappreciable, hardens the film, and is very often used first for that purpose. The moment the mordant has penetrated the thickest portion of the film, wash the plate under a stream of cold water with a tuft of cotton-wool. Clean with whiting and water to remove all traces of the film.

Now that perchloride of iron is an article of commerce, the *Photographischer Mittarbeiter* recommends dissolving crystals of it in distilled water until it marks 40° Beaumé, this is marked No. 1; Nos. 2 and 3 are made weaker, and No. 4 registers 30°. All of them should have the same temperature, and should on no account fall below 65° F., nor exceed 77° F.

A small portion of bath No. 1 is poured into the "dish" formed by the wax-border; this will etch those portions of the plate where the pigment film is the thinnest. When the biting-in has proceeded sufficiently in the shadows, use

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* *Photographische Correspondenz*, 1884.

† Vol. ii., No. 6.

Solution No. 2, about 36°, and continue the etching until the half-tones are ready. With the Solution No. 3, the finer portions are etched, and No. 4 is used for a moment or two just to attack the high-lights in a very slight degree. The etching as it proceeds is easily observed, as the metallic glaze is visible through the pigment picture at all those parts not attacked by the mordant, whereas the copper blackens at all those parts etched.

When the etching is at an end—*i.e.*, the high-lights have lost their metallic lustre—pour off the solution and immerse the plate quickly in a dish of water containing a small quantity of potash ley; pull off the wax border and clean off the pigment film, which has now become covered with minute blisters all over its surface, rinse under the tap, and dry with a soft rag, then clean with a little rottenstone and turpentine. Lastly, rinse the plate with a solution of vinegar and salt until the etched portions attain their original red colour. Should any of the bordering wax adhere to the plate, remove it with a spatula of hard wood before using the turpentine.

Herr Sommer's (*Photo. Correspondenz*, 1884) recommends strengthening the depths by going over the cleaned plate, slightly warmed, with a smooth leather roller charged with resist varnish or etching ground, and re-biting for two minutes, then roll up again, covering all but the deeper shadows, which can be etched for three to four minutes. As this after-etching (or re-biting, as it is called) must be done with great care and judgment, it had better be done by four etchings, each time covering the next deepest tint, and allowing the fluid to act for one minute.

Generally speaking, printing plates obtained by the above process, notwithstanding the greatest care, are not fit to print from without further handling. They will require retouching. This is acheived similarly to mezzotint engraving—*i. e.*, the high-lights are put in with a burnisher, and the shadows, if not deep enough, or if the grain has disappeared through the prolonged action of the mordant, are gone over with a "roulette" to give a bite for the colour.

It sometimes happens that during the etching manipulations a very interesting reaction occurs; small star-shaped indentures are formed, which, if not retouched by the engraver, will give dark spots in the prints. These stars were supposed by some to emanate from impure copper; by others, from microscopic impurities in the pigment tissue; now it is found that the etching solution is the cause. If a fresh solution of iron is employed, the above fault will be sure to put in an appearance more or less. This shows at once the remedy: some strips of clean sheet copper must be immersed in the etching solution until its colour is sufficiently changed, showing thereby that it is up to the mark. The temperature of the apartment used, as well as that of the solution, is of great importance. A warm solution works more energetically, and shallow monotone pictures are the result; whereas a cold solution generally over-etches the shadows, and underbites the grain of the plate. Between sixty-five and seventy will be found to be a good temperature for both work-room and mordant. The chief points for the success of the whole process are, firstly, a good diapositive from which to produce a good negative; secondly, a grain to suit the picture; and thirdly, skill in judging the etching so as to ensure leaving off at the right moment.

THE ASSERTED YELLOWING OF PLATINOTYPE PRINTS.

With reference to the recent statement of A. Pringle, to the effect that exposure to the action of sulphuretted hydrogen caused a platinotype print to become yellow, we may mention that through the courtesy of J. Traill Taylor, we have seen Pringle's specimens, and our own opinion about them is, they indicate that sulphuretted hydrogen has no action on platinotype. The paper basis is very slightly yellowed, the depth of tint being about that one would expect in the case of a well-cared-for engraving about a hundred years old; but this yellow tint is at once removed by weak chlorine water, or by a weak acidified solution of bleaching powder, when the platinum print shows up in all its original vigour. In fact, the same course applicable to a yellowed engraving is of service here.

The yellow colour also disappears slowly under the action of other oxydixing agents, and in the case of a piece of the print given to us by J. T. Taylor, exposure to light caused the yellowish tint to become less marked.

All this becomes very clear if we assume a trace of work to have remained in the print—a trace so small as not to darken under the action of any amount of sulphuretted hydrogen contained in the air, but still sufficient to produce a slight tinting when exposed to a strong dose of sulphuretted hydrogen. The minute trace of sulphide of iron formed might be supposed to oxidise on exposure to light and air—and, indeed, we have mentioned that the tint on Pringle's print lowers on exposure. Pringle has, it seems to us, made a great thing out of very trifling data, and the discussions which followed will probably serve to considerably establish the confidence of the public in the permanency of platinotype prints.

With reference to the note made last week as to the experiments of Chapman Jones, we may say that, to our own eye, the trifling amount of yellowing observed by this scientist is about equal to that in the case of Pringle's specimen. Both are insignificant, but about equal; and both are readily removed by the usual bleaching agents, the image being left intact.

BUSINESS MANAGEMENT.

BY CRITICUS.

No. II.

Judging from our own observation, as well as from the information which we have been able to procure from a large circle of acquaintance engaged in business more or less directly connected with our subject, it seems that the number of those pursuing the practice of photography professionally is unquestionably in the ascendancy. Perhaps not in the direction of direct portraiture, the mania for which we are sometimes told is very much less marked now than that which characterised a former epoch, but in its comprehensiveness as an art exercising great influence in the advancement of commercial industry, as well as an extremely valuable auxiliary in scientific researches of every kind, does the chief claim for expansion lie. At any rate, it cannot be said with any semblance to truth that photography in its business capacities pertains of that exclusiveness which it was at one time the custom to regard it, for as an example, the mechanical printing processes such as Collotype, Woodburytype, and others depending upon photographic action, afford useful and profitable employment to a numerous body of workers both male and female, alike engaged in furthering the means of artistic production, and the general advance of commerce. One of the many instances of the importance of these mechanical processes may be noted in the rapid growth of a new class of business, or, perhaps, more correctly stated, a tolerably recent application of photographic representation to ordinary commercial purposes. We refer to the—in many cases—beautifully executed illustrations of wearing apparel, articles of jewellery, and ornamentation, now exhibited in numbers of shop windows, affording, as they very often do, fully as much, if not more interesting amusement to the connoisseur, than might be obtained from scrutinising a series of ordinary photographs displayed in an unattractive manner, such as the specimen frames of professional photographers in a neglected state are apt to convey. Now this phase of commercial photography, which also includes well-executed portraits used for advertising purposes—cigarettes, for instance—must be regarded as a special branch of trade having at least two distinct sections, viz., one by which negatives are produced, and the other embracing the multiplication of positives; very large quantities of these latter being usually required. Probably owing to the magnitude of many such commissions, the two processes are seldom carried out by the same individual. In a few large firms all the work is executed upon the premises; but the percentage is not high.

Seeing that, as a rule, manufacturers and their wholesale agents much prefer a well-executed photograph to aid them in the distribution of their products to any other species of illustrative art, we feel bound to direct attention to their requirements, especially as it widens the scope of photographic enterprise we desire. Unfortunately, economic reasons appertain largely in the consideration of successful commercialism, and if individual interests combine to prevent manufacturers and others from putting their laudable desire into practice, the failure must be the fault of photographers, for there can be no doubt, from the evidence before us, that this great producing country offers exceptional opportunities in this direction. We know there are many houses, established more especially for producing portraits, who receive commissions to supply negatives of art works and novel inventions; in these cases the honorarium asked is sometimes judged by the client to be ample, although deemed to be barely sufficient from the photographer's point of view. Especially is this unsatisfactory, when what appears to be a just and honourable fee has been named. In matters of this kind, too, it not unfrequently happens that probable customers, having economy in view, are the possessors of estimates from several other houses, and could we by any possibility examine their contents, we may safely predict great latitude in the charges quoted for the same production. We think that for work of this class, not dependent upon exceptional ability beyond that to be found in any well-appointed photographic establishment, it cannot but prove a mistaken policy upon the part of the principals concerned, to permit a great divergence in rates for ordinary copying to exist. Naturally uniformity in prices for such work can only be determined by the law relating to supply and demand; still, this latter condition would be likely to increase earlier by the adoption of an approximate, and at the same time moderate, scale of charges, and, what is of equal importance, greater confidence would be established. Quite recently the head of a large wholesale house in London told us of his non-success in negotiating a contract for several thousand panel photographs of a speciality in fabrics, at a price proportionate with other available methods as recognized by commercial instincts. Bromide positives were not entertained, for the reason that they failed to convey an approximate idea of the colour of the goods, which could be much better rendered on albumenized paper, or in pigmented gelatine, a matter of some consequence to the customers of the firm living in the provinces or abroad. Ultimately we were given to understand that all photographic processes were put aside by this firm in favour of chromatic print illustration.

Quantities in photographs, as in other productions of an artistic nature, must be of necessity, and are, turned out at competitive rates. By this means every new shape or change in pattern of hats, boots, gloves, and such like things, that are intended to cater for public favour, is introduced by photography.

Perhaps few people, other than those engaged in the work, will realize the amount of care required in arrangement in lighting such an apparently simple subject as a series of hats; yet a glance at one of those illustrated sheets which can be seen at any hatter's will suffice to satisfy those conversant with photographic manipulation that no trivial task has been performed. Business of such a nature, however, seldom falls to the share of portrait photographers now-a-days as it was wont to do formerly. The reason for this is not difficult of explanation, owing to the circumstance that many of our manufacturers find it both economical and more convenient to instal the necessary appliances for executing the work upon the premises. The initial outlay for plant made, the remainder presents little diffiulty. An appeal to the advertising colums of the PHOTOGRAPHIC NEWS may be relied upon to secure the services of a practised hand capable of carrying out the entire photographic requirements of the establishment, unless they be of mammoth proportions.

There are many articles less influenced by the caprice of fashion other than those which demand such special provision as above alluded to, which may still be regarded as a species of business to be found in the daily practice of professional portrait photographers. It is needless to enumerate such objects as readily commend themselves to the ordinary trader as fit for representation by photographic means; but it is engaging in little commissions of this nature at what may possibly be, even to him, an unremunerative rate, that an amateur embryo professional photographer takes his header, inasmuch as having executed an order and received payment therefor, he has established a precedent and a professional position out of which it becomes difficult to extricate himself.

We encountered a curious experience a few months ago at the house of a friend. The conversation was changed to the subject of photographs, which gradually gave rise to the production of numerous execrable specimens. Being desirous of appearing a novice prevented that straightforward expression of opinion being given which might have been so irksome to our host; so by a few simple questions, not directly to the point, the secret of production was—amid much high colouring—slowly divulged. Our friend's clever acquaintance was an amateur, who had formerly received some friendly instruction in the art from a *bonâ fide* photographer's assistant in a fashionable West-end business—and this is how he utilized his knowledge. Possessing only one quarter-plate printing frame, and a few cracked dinner plates, his outlay for apparatus had not been extensive; 'cuteness did the rest, though. This gentleman would first secure a customer, then barter with an itinerant photographer at the seaside, Hampstead, or elsewhere to take a quarter-plate glass positive of the client. By dint of displaying a little knowledge of the subject, a fair positive could be relied upon. Varnish was not in the contract, for a reason we shall now see. Returning home with the collodion positive, he subjected it to mercurial intensification—a very old process; varnishing, as a matter of course, followed, then printing on ready sensitized paper, which, by the way, we were informed was a very expensive affair. Toning was explained to us, and the rest of the paraphernalia, up to the delivery of the mounted and ironed copies, at so much per dozen, and collecting the cash. All this was detailed with more precision than we care to repeat. Upon leaving, however, we thought it advisable to drop a hint as to our possessing some knowledge of photographic business, and should hesitate to consider the persevering gentleman an amateur any longer.

A SHORT TOUR IN THE DOLOMITES.

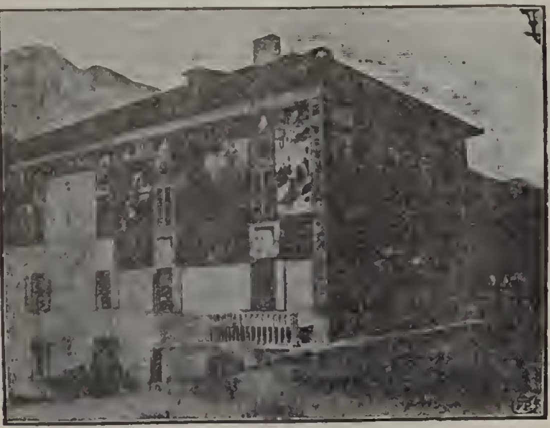
BY "JEAN VILLE."

AFTER a few days spent, last autumn, in the Gross Glockner district, we started from Lienz for a short tour in the Dolomites, accompanied by our guide, Joseph Imboden, of St. Nicholas.

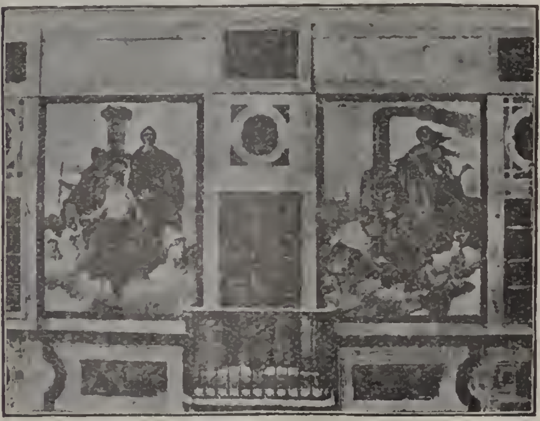
We entered South Tyrol by the Ampezzo Road, at Toblach, and from thence drove through most beautiful scenery to Landro. There we found the best hotel we had stopped at since leaving Switzerland. The landlady was extremely civil, the food good, very nice rooms, and what we still think the most charming situation of any place which we visited in Tyrol. The lovely little Dürren See is a short ten minutes' walk from the hotel, and in its still waters are reflected the magnificent precipices of the Cristallo and its hanging glacier. Numerous side valleys open in all directions, and every step up the slopes of the hills discloses new beauties. I think that it requires some courage to gainsay the opinion, continually expressed by much more competent authorities than myself, that there is no other centre in the Dolomites which offers so many attractions as Cortina. I would put Landro far above it for the magnificence of its scenery, and I should much prefer to make a lengthened stay at either Schluderbach or Caprile, rather than at Cortina. We spent nearly a fortnight at Cortina, and I cannot but think that the great breadth of the valley, and consequently the long distance which has to be traversed before a different view opens up, is a drawback to the place. I was much pleased to find, on reading an article in the August number of the *Alpine Journal*, that such an authority on this district as Mr. Julius Meurer, states that "the most glorious point within the Ampezzo group is to be found near the hotels of Landro and Schluderbach," and with this opinion I entirely agree. The Croda Rossa is, in itself, an object of such splendour that it would make any place famous. It rises beyond Schluderbach in rocky walls, streaked with a blood red. He who should faithfully render the colour on canvas would be laughed at by many who would not believe that the intensity of the hue could be natural. Such gorgeousness of colouring as that on the Croda Rossa I have never beheld elsewhere. In fact, so enthusiastic did we become about its beauty, that Imboden enquired, with a touch of sarcasm in his voice, if we preferred it to the Matterhorn, and, on our replying that in some ways we did, he became so jealous for the reputation of his native peaks, that he went on to enumerate others, thinking thereby to modify our previous opinions; but, as a comparison between the Weisshorn and the Croda Rossa is as absurd as one between an iceberg and a tropical forest, we closed the discussion by praising both the mountains in the strongest terms we could think of.

DURREN SEE.

On arriving at Cortina, we installed ourselves at the Aquila Nera. This hotel has three attractions: absence of noise, owing to its distance from the bells of the church, very fair food, and really good frescoes on the exterior of the Dépendance, painted by a brother of the landlord, who is now carrying on his profession as an artist in Venice. As the weather was still all that could be desired for excursions, Imboden suggested our setting out on the following day for the Tofana hut. We agreed, and the next afternoon a little procession could be seen, ascending the stony slope above the forest. The rear of the party was brought up by two natives of Cortina, one carrying the camera, and the other a load of blankets and straw, with which luxuries the hut, only just completed, was not yet furnished. Our kit also included a saucepan, as the cooking utensils were said to be in cupboards which a previous party, who had lunched at the hut, had been unable to open. However, to make a long story short, a discreet application of Imboden's axe overcame the resistance of the cupboards, and we found many luxuries within, including tablecloths and napkins! The two Cortina men were rather disturbing elements during the night, as they omitted to remove their boots, and consequently made a good deal of noise whenever they turned, besides displaying a large amount of activity with their nasal organs. One of the Austrians was a guide by profession, and the other was a driver, whose name was Philip. The latter had never made the ascent of a mountain, and we therefore decided to take him with us up the Tofana, as on the Gross Glockner we had had more than enough of guides who were anxious to show us the way. Philip was enchanted when he heard our decision, and was so obliging, and it was such a pleasure to see his enjoyment during the excursion, that we were very glad we had taken him with us. The Tofana is such an easy peak that I can find very little to say about it. The view from the summit, which it took us two hours and twenty-five minutes to reach from the hut, was very lovely that cloudless morning, and the hour and a quarter of stony couloir above the hut, very trying to the temper. We were back at Cortina at eleven o'clock. As it is wise to profit to the best of one's ability by fine weather, whenever one is fortunate enough to have it, we planned a journey to Fedaya for the day following our return from the Tofana. Fedaya is a primitive inn near the Fedaya Pass, and is used as night-quarters by most of those intending to climb the Marmolata, which is the highest of the Dolomite peaks. We also wished to go up this moun-



DEPENDANCE OF HOTEL AQUILA NERA.



FRESCOES ON THE HOTEL.

tain, and hoped that by leaving Cortina early we could reach Fedaya the same evening, and return to Cortina next day. When, at 5 a.m. next morning, I was about to leave my room and go down to breakfast, Imboden came to tell me that the weather looked very bad. It had seemed so perfectly settled the night before, that the idea of such a rapid change had not occurred to me, and I was loath to believe in it. However, on going out into the road, the whole valley could be seen shut in by a level covering of cloud, and the wind blew in gusts from the south. Things could hardly have looked worse, and yet their unpromising appearance gave me a little hope, for it seemed most unlikely that a long spell of cloudless weather would break up so suddenly and completely. I therefore begged Imboden to decide nothing for an hour, after which time, if the clouds did not lift, rain would probably begin to fall.

We had breakfast during this interval, but hardly was the meal finished, when a pink glow through the mist revealed the position of the Tofana, which slowly unveiled itself, and at last stood out, sharply defined, against an almost unclouded sky. We therefore hastily prepared for our journey across the hills. The landlord told us that we could drive all the way to Fedaya, and volunteered to provide a suitable vehicle for us. This conveyance consisted of a narrow blue trough, without springs, and drawn by one mule. I noticed that Philip had packed a lady's saddle in the carriage, so there seemed to be doubts as to the possibility of the vehicle reaching Fedaya. As far as the Pass the road was fair, but from there to Andraz I can only describe it as a stony precipice. Such a road to drive down I never before either saw or imagined, and right glad was I when we got to the picturesque little village of Andraz. The innkeeper assured us that we should gain much time if, instead of going round by Caprile, we took the more direct mule path; he said that we should thus save quite four hours. We were, naturally, much pleased with the prospect of thus shortening our journey, and started from Andraz with the firm conviction that in a couple of hours we should reach Fedaya. But in a little time our confidence in the information which we had received began to be shaken. First, a peasant told us that Fedaya was at least four hours further. Then a man from whom we made enquiries seemed to be quite unaware that a path to Fedaya lay in the direction towards which our faces were turned. At last, when we began to have serious ideas of retracing our steps, and going down to Caprile, a gap against the sky, between two distant mountains, was pointed out to us, and we were told that through that gap we should have to go, as beyond it lay Fedaya. But how about the mule? Was it possible that an animal could cross that lofty pass? Imboden thought not, and if not, what then? Imboden could not carry the bags which were hung to its saddle, and Philip would have to take it back to Andraz. We solved the problem by deciding to take a peasant from the last village in the valley, who would act as porter, and also serve as guide, to the inn, for the mist had once more begun to sweep over the mountains, and seemed as if it would soon conceal even the Pass. Our baggage was unusually heavy, as we knew that, so late in the season, we ran the chance of finding the inn at Fedaya closed. We had, therefore, brought sufficient provisions with us from Cortina for two days, and also a large plaid, in view of having, perhaps, to spend the night in a hay chalet. We had forgotten a saucepan, however, and this we intended to borrow from our porter. At last, we reached what seemed to be the highest cluster of houses in the valley. Philip was instructed to enquire in Italian for a porter and a saucepan, and also to ask, for about the tenth time that day, if it was known whether the inn at Fedaya was open or not. We were told, as had been the case in reply to all our previous questions on the subject, that the inn might be shut, or it might be open, which did not enlighten us much. A porter offered himself in the person of a gentleman of advanced years and with two crutches. We considered it advisable to decline his services, and after a time an Italian workman was induced to accompany us, and to bring a saucepan with him. It was very funny to see this individual, laden with my ice axe, the saucepan, and our three umbrellas, heading the procession. He told us that two hours would take us to the Pass, and that the mule could go over it; but Imboden's reply, called forth by the contradictory nature of all the information we had that day received, was, "I no longer believe anything which anyone tells me!" Nevertheless, in about two hours, we were very close, mule and all, to the gap, which we had looked at for so long, from below. I began to walk as soon as the slope steepened, and the mule, relieved of my weight, and of the guiding hand of Philip, who helped himself up by clinging to its tail, took all sorts of erratic courses. At one moment it dashed off the path and across the stony gulley, while Philip frantically held on, and tried to control it. Then, as both seemed almost over a precipice, the animal turned, and cantered straight up, till, as Philip began to think that things looked better, the mule would again strike off towards the side, and bring itself, Philip, and the bags, to the verge of destruction. However, at last, we all stood on the ridge in the thick, driving mist.

PEAK OF THE TOFANA.

For some distance on the other side of the Pass there was a well marked track. This led to some châlets, but below them the path ceased. Our Italian porter ran hither and thither, vainly trying to discover the whereabouts of Fedaya. My suspicious mind suggested that he might find it convenient to disappear in the fog with the sack of provisions which he carried. I hinted as much to Imboden, who promptly recalled him, adding, "If you don't return quickly, I'll come after you!" It seemed so hopeless to try and find Fedaya in such a mist, that we determined to return to the châlets, and spend the night there. Needless to add, our hopes of ascending the Marmolata were at their lowest ebb. As we slowly mounted towards the châlets the fog lifted a little, and part of the valley below could be seen. We therefore turned once more towards it, and before long a little lake disclosed itself. Then we knew that we were descending in the right direction, and very soon the inn itself came into sight. On approaching it signs of life were visible, and the proprietor ran to the door, surprised at our arrival so late in the season. He shook hands vigorously all round, led us in, and then began to shake hands all over again. I fancy that the warm expression of the exuberance of his joy was partly from his having done his best to finish off the summer's stock of wine. A small bedroom was assigned to me. I believe that it had been hitherto the old gentleman's apartment, judging from the various garments which were strewn about. Dirt reigned supreme on the floor, the walls, and the ceiling. An ample red plumo covered the bed, but blankets there were none, though some sheets were added by an obliging, but unintelligent young woman. The landlord was to leave Fedaya in a day or two, so we were only just in time to profit by the hospitality of his inn. He was evidently very anxious to prevent my feeling dull, for he sat at table with me when my dinner came in, and was not satisfied unless I talked continually. This became so tiresome at length, that the idea of sending for Imboden occurred to me; for I hoped that, when my guide and I discussed our plans for the next day in a (to the landlord) unknown tongue, he would, perhaps, be bored, and retire. But the old gentleman merely chuckled softly to himself when he heard us begin our conversation in English, and informed us that he, also, understood a little of that language; but as his merriment was greatest whenever my disparaging remarks about his inn and himself were strongest, I am inclined to think that his comprehension of our observations was incomplete. On my asking for a half bottle of red wine, a full sized bottle was brought, with the information that none smaller could be supplied. I therefore poured out a glass for myself, and gave the rest to Imboden, and this unsuspecting individual, placing it for a moment on the table, paid for his rashness by seeing the innkeeper seize the bottle and promptly consume all its contents! In reply to a hasty exclamation of surprise and anger from me, the old man tranquilly remarked, "A bottle of wine, more or less—what is that?"

When I went to my room the rain still fell heavily, and my heart sank when I thought that, after all the discomfort we had endured, we should most probably be obliged to return to Cortina without having been up the Marmolata.

During the weary hours which followed, I spent the time in examining the little strip of sky which was visible from my window. At about 3.30 a.m. I saw, with delight, a star or two, and at four o'clock Imboden knocked at the door, saying, "I think that we may start."

On entering the dining room for breakfast, I found the landlord bustling about, and in a much less confused state of mind than he had been in the evening before. Imboden told me that our host had expressed his intention of accompanying us as far as the glacier, but as his society was far from pleasant to me, and as, by daylight, we could have no difficulty in finding the path, I suggested that a discreet increase on our usual pace at starting might rid us of our companion. Philip was to make the ascent with us, and was very glad to come, though the landlord had nearly succeeded in frightening him the previous evening by assuring him that unless he wore crampons, he would never be able to go farther than the glacier.

Imboden shows his supreme contempt for all advice from unreliable sources by invariably agreeing with whatever remark is made, and though his "Ja, ja," oftentimes causes the people to think us utter idiots, it always obtains for us a welcome freedom from further annoyance and argument.

By 5.30 we were off, the landlord armed with an alpenstock, and evidently prepared for quite an expedition. We three glanced at each other, and then started up the valley at the rate of about six miles an hour. "Das ist *viel* zu schnell!" called the innkeeper, gaspingly; but we unblushingly assured him that it was our ordinary pace, and furthermore added that we intended to keep it up all the way to the summit of the Marmolata. In less than two minutes the landlord was breathless, and by the time that we began to mount the steep little path twards the glacier, he could be seen returning home. In about an hour we reached the ice. Owing to the rain of the night before, it was excessively slippery, and it took us twenty minutes to cut steps up it to the more gentle slopes above. Once fairly on the glacier, we steered straight for the snowy valley, to the left of the highest peak. The rocks to our right, enclosing one side of this valley, looked very tempting to my eyes, unused, as they then were, to Dolomite deceptions. I asked Imboden if we could not ascend by them, in preference to mounting by the snow slopes; and he answered that he would see when we got a little closer to them. After a time, I was much pleased to see Imboden bearing away to the right, and we were not long in gaining the rocks. From an examination of the visitor's book at Fedaya, and after carefully studying the account of Mr. Tuckett's ascent given in Ball's "Eastern Alps," we are unable to say if anyone has followed quite the same route which we did. It seems to us that Mr. Tuckett's route lay to our right, and though we carefully looked for scratches on the rocks and other signs, we could find no trace which would lead us to suppose that another party had taken exactly the same course followed by us. At the same time, our "variation," if it is one, is so slight as not to deserve a place in the list of new routes. At first, the rocks were smooth, but not particularly steep; gradually they grew steeper, but not less smooth, till, at last, they became steep, smooth, and rotten. In one place some powdery snow lay over them, and the passage of this little bit took some time, but Philip and I were firmly placed while Imboden worked his way upwards. Philip got on admirably, and uttered not a word. When asked on his return how he had felt on the rocks, he replied "Ich habe gedacht, ich bin hier, und ich will nichts sagen; aber—ich hatte Angst!" (I thought, I am here, and I will say nothing, but—I feared!) After some time a steep and rotten piece of rock had to be climbed, and above it we could see that all was plain sailing. Philip was placed in a secure position, and was told to hold an axe under Imboden's foot, as he would not trust the crumbling rock. This *mauvais* pas surmounted, we could put on the pace, and before long we reached the top of the snowy slope up which the ordinary route lies. From here the rest of the ascent is over easy snow slopes, which, however, we had to go up very slowly, as Philip showed signs of exhaustion, and the height, no doubt, also affected him. We had no view whatever from the summit of the Marmolata, and did not remain there very long.

Our descent to Fedaya, and our journey from there, by Caprile, to Andraz, were so entirely uneventful, that I will spare my readers an account of them. When we reached Andraz, it was too late for us to go on that evening to Cortina, so we spent the night in the excellent inn, which seemed doubly comfortable after Fedaya.

The following day we reached Cortina in drizzling rain. As the season was so far advanced it was no use for us to linger on in the Dolomites, so, sorrowfully renouncing the ascents of the Pelmo and Cristallo, we set out the next afternoon in heavy rain for Langarone and Venice.

PRINTING LANTERN PICTURES BY ARTIFICIAL LIGHT ON BROMIDE PLATES FROM VARIOUS SIZES.

BY A. PUMPHREY.*

There can be no question that there is no plan that is so simple for producing transparencies as contact printing, but in this as in other photographic matters, one method of work will not answer all needs. Reproduction in the camera, using daylight to illuminate the negative, enables the operator to reduce or enlarge in every direction, but the lantern is a winter instrument and comes in for demand and use during the short days. When even the professional photographer has not enough light to get through his orders, how can the amateur get the needed daylight if photography be only the pursuit in spare time? Besides, there are days in our large towns when what daylight there is is so yellow from smoke or fog as to have little actinic power. These considerations and needs have led me to experiment and test what can be done with artificial light, and I think I have made the way clear for actual work without further experiment. I have not been able by any arrangement of reflected light to get power enough to print negatives of the ordinary density, and have only succeeded by causing the light to be equally dispersed over the negative by a lens as used in the optical lantern, but the arrangements required are somewhat different to that of the enlarging lantern.

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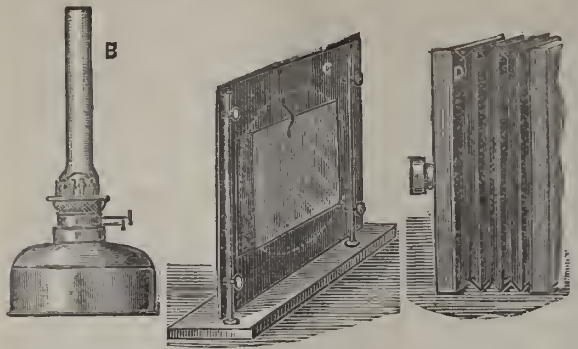
* Read before the Birmingham Photographic Society.

The following is the plan by which I have succeeded best in the production of transparencies.



B is a lamp with a circular wick which burns petroleum and gives a good body of light.

C is a frame for holding the negative, on the opposite side of which is a double convex lens facing the light.

D is the camera and lens.

All these must be placed in a line, so that the best part of the light, the centre of the condenser, and the lens are of equal height.

The method of working is as follows :—The lamp B is placed at such a distance from the condenser that the rays come to a focus and enter the lens ; the negative is then placed in the frame, the focus obtained, and the size of reduction adjusted by moving the camera nearer to or further from the condenser and negative. In doing this no attention need be paid to the light properly covering the field, as that cannot be adjusted while the negative is in its place. When the size and focus are obtained, remove the negative, and carefully move the lamp till it illuminates the ground glass equally all over, by a disk of light free from colour.

The negative can then be replaced, and no further adjustment will be needed for any further reproduction of the same size.

There is one point that requires attention : the lens used in the camera should be a doublet of about 6-inch focus (in reproducing 8½×6½ or smaller sizes), and the stop used must not be a very small one, not less than ½-inch diameter : if a smaller stop is used, an even disk of light is not obtained, but ample definition is obtainable with the size stop mentioned.

In the arrangement described, a single lens is used for the condenser, not because it is better than a double one, as is general for such purposes, but because it is quite sufficient for the purpose. Of course a large condenser is both expensive and cumbersome ; there is therefore no advantage in using a combination if a single lens will answer.

In reproducing lantern pictures from half-plate negatives the time required on my lantern plates is from two to four minutes, using 6-inch condenser. For whole plate negatives from two to six minutes with a 9-inch condenser. In working in this way it is easy to be developing one picture while exposing another.

The condenser must be of such a size that it will cover the plate from corner to corner. The best part of an 8½×6½ negative will be covered by a 9-inch condenser, and a 6½×4¾ by a 6-inch condenser.

With this arrangement it will be easy to reproduce from half or whole-plate negatives or any intermediate sizes quite independently of daylight.

Notes.

The cutting of portraits upon cameo-shells is an art which, according to J. B. Marsh, might well be practised much more than it is. Lecturing at the Society of Arts, he said that a workman can cut a portrait from a photograph in a few hours.

"Having drawn the face, take up a scawper," says J. B. Marsh, "and cut the outline almost down to the ground ; then separate the hair from the forehead, outline the ear, divide the mouth and nose from the cheek by a single upward cut to the eye-brow ; from the corner of the nose cut a triangle—that will form the eye ; make two cuts for the nostril and chin, and midway another cut will mark the mouth ; sink the neck, outline the collar and coat ; then the face is what is technically known as "roughed."

But what is a "scawper !" may be asked. We can answer the question by quoting what the lecturer says about tools. "There are only two kinds of tools made use of by workmen—the scawper, and the spit-sticker. The scawper is of two kinds, one having a flat side, and the other a round side. With the round scawper, the white of the shell is scooped out, and the face or design medelled ; with the spit-sticker the finer cuts are made ; and with the flat scawper the work is smoothed and finished."

All that is necessary for beginning, including a dozen pieces of shell, can be obtained, so says Mr. Marsh, for 13s., from Gray and Sons, jewellers' material store, Clerkenwell Green, or at 27, Sloane Square. Here is the list :—"Four round-sided and one flat scawper, one spit-sticker, one file ; seven tools, 1s. 9d. ; one fret-worker's grip, 1s. ; a dozen pieces of shell of various sizes, 5s. ; one broom handle, 2d. ; cake of cement, 1d. ; one oilstone, 5s. : total 13s. Those wishful to learn more should refer to the *Journal of the Society of Arts* for Jan. 21.

This is the newest phase of photographic society life in America. The Secretary of the Society of Amateur Photographers of New York read the following :—"The —— Manufacturing Company take pleasure in presenting the Society of Amateur Photographers of New York with an 8 by 10 reversible back camera and two holders, fitted with kits, as a Christmas present for 1886." "We take pleasure in sending you herewith a 19 by 24 porcelain tray to present to the Society of Amateur Photographers, with the compliments of the season and best wishes for a Happy New Year from —— —— and Co." The President then rose and advised those who had not given it attention that they could have their portraits taken gratis at Messrs. Pach Bros., 841, Broadway, upon presenting their membership ticket.

The *Sheffield Independent* tells us that an important firm of publishers has determined to make use of photography in order to preserve a record of valuable documents in case of fire. The firm in question is engaged in the production of a colossal and costly dictionary, of which many thousand sheets are already prepared. Each sheet is a monument of labour, which it would be difficult to supply again if any catastrophe were to happen. Every sheet of the copy has, accordingly, been photographed in reduced size of two inches by one and three-quarters. All the words can be read with a magnifying glass (this, by the way, premises that the writing in the original must be exceedingly good), and the negatives are carefully stowed away in a separate building. Some publishers—notably those of the American magazines—who are rather apt to overstocking themselves with copy, have hitherto adopted, says the *Independent*, the custom of having contributions copied out by a type writer, copy and original being kept in separate quarters till used. Photography, says our contemporary, will be cheaper than that, and may be expected to supersede it. We should be the last to limit the use of photography, but we are inclined to ask, does not all this presuppose that there are no such things as fire-proof safes? Most London publishers keep their MSS. in such receptacles, and are perfectly contented; and so are bankers and lawyers, who are responsible for deeds and securities.

"I am going to give up photography altogether," said a friend of a somewhat melancholy temperament to us the other day. "Why, are you doing so badly?" we asked. "Well, not exactly badly, but everything seems against one. What on earth is the use of persevering, after Sir William Thompson's statement at the Royal Institution, last Friday, that the sun had only ten million more years to live? It doesn't give photographers a chance!" We fancy that the last three months of fog must have been the cause of our friend's depression.

Some little opposition has been shown to the new journal of the Board of Trade, which has now reached its sixth issue, but the information it is in a position to give is likely to prove useful. Paper manufacturers, for instance, may like to know that photographic and phototypic papers figure in the list of the Greek revised customs tariff, where ingenuity seems to be exhausted in the search of exciseable articles. These manufactures were up to November last admitted into Greece free, but are now subjected to a small import. We do not notice that photographs are mentioned, but presume that they are classed with "Lithographs, engravings, &c. (not framed)." If so, they can still be exported free of duty. The same privilege should apply to photographic apparatus, since "scientific instruments of every kind" are admitted free.

Photography is becoming quite a common subject for discussion by the Astronomical Society. At the last meeting a paper by Professor Pritchard on "The Application of Photography to the Determination of Stellar Parallax," was read, in which the adaptibility of the photographic process was demonstrated. Some doubt, Professor Pritchard stated, had been expressed as to whether there was any unequal stretching of the photographic film due to the unequal way in which the water flowed upon the plate while it was being washed. In order to settle this, four plates were taken every evening, and, out of two hundred taken, only three showed any evidence of such unequal stretching. Mr. Ranyard threw some doubt on the value of photography as applied by Professor Pritchard in regard to the difficulty of measurement. A photographic plate, he contended, under a microscope did not show even shading, but broke up into a number of different dots or granulations which, in the case of dry plates, were larger than in the old collodion plates. Mr. Common and the Astronomer-Royal were, however, of a different opinion in so far as the difficulty of measurement was concerned, the Astronomer-Royal considering that the results were more accurate than those obtained by the heliometer, and not only so, but stars at a greater distance might be utilised. On the whole, the discussion was favourable to photography.

He was a contributor to a comic paper, and knew nothing absolutely of photography. In a rash moment an amateur took him to a lecture on the history of the art from the Daguerreotype to the gelatine plate. After the lecture, a number of examples of various processes were handed round. "And what is this?" he asked, holding up a specimen. "Oh! that's an albumen plate." "Ah, I suppose that's what you mean by *an eggotive?*" Now, the question is, was he joking?

A legal opinion has been given in the *English Mechanic* on the question of the responsibility of a photographic dealer in regard to insensitive plates of a known maker which he had sold. The customer, because he had paid the dealer, and because he had bought elsewhere plates of the same make which had turned out well, held that the dealer was liable, and ought to refund the money. The legal correspondent of the *Mechanic* is of opinion, with us, that the customer has no remedy. He asks: "In whose hands can you localise the loss? Was it in the maker's, or the carrier's, or the dealer's, or yours? Again, what is the standard of sensitiveness, and does the maker or dealer profess to sell plates as possessing this or any other standard?" This is perfectly true, and suggests the question, shall we ever have a real standard of sensitiveness? From what was stated at the last meeting of the Photographic Society it is pretty clear that even a standard light of perfect reliability is at present unattainable. A standard of sensitiveness, therefore, must be considered to be somewhere in the dim future.

BEAUTY OF POSE, PROPORTION, AND FEATURE IN PORTRAITURE.

BY HUGH BREBNER.*

In an old French book upon art, whose title and author I have long since most ungratefully forgotten, I remember reading a few chapters upon portraiture, in which likeness of pose, likeness of proportion, and likeness of feature were emphasised, in the order I give them, as the three chief desiderata in a good likeness. As the work to which I refer was written long before photography existed, and was read by myself when studying the rudiments of painting, I, at the time, saw little in the rules laid down, save that the characteristic action or pose of the subject should be broadly and thoroughly realised mentally before beginning to "block out" the proportions, and that this broad massing should, in turn, precede any elaboration of feature or detail. I was satisfied then of a fact which I had vaguely realised before—viz., that it was folly to begin by working from one feature to another in the hope that all would come right in the end; but it was not till I had taken up the art which we all mutually pursue that I fully understood the importance of a large preliminary view, for it was only then that I realised that in selecting and emphasising what he considers the beautiful, and, at the same time, ignoring or subordinating what he looks upon as ugly, the power of the photographer is comparatively limited. When he makes what he acknowledges to be a mistake through forgetting that beauty, "grace, and, we may add, the likeness, consists more in taking the general air than in observing the exact similitude of every feature," he cannot rectify it save on a *rosa tabula*. Still, I do not see why the monochromatic "studies" of *mens* and lens should not please the beauty-loving eye better than the objective attempts at realism made by such of our brothers of the brush as have not yet found out wherein photography is capable, and wherein incapable, of taking the ground from under their feet. Setting aside colour, and tone implying colour, and also technique as referring to the visible evidence of handicraft, it will be found, I think, that the principles upon which the beauty of a single line is determined are applicable to every phase of criticism to which a picture may be subjected on its own merits.

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* Read before the Edinburgh Photographic Society.

To justify this statement, and thereby make my meaning clear, I would remind you that without light and shade together no form could be visible. And what we know to be true where form exists in absolute darkness, would be equally true were everything of the same brilliance. For instance, the form of the sun is lost to sight when the sky in the zenith is so bright as to dazzle our eyes. Since, under such conditions, we can have no visible form, we can have no apparent line. For, popularly speaking, a line is simply an empirical term applied to designate the impression of form conveyed by the interference of one density with another, under certain conditions of illumination. In this way we talk of the line of the horizon, a line of smoke, a line of soldiers, or a line of houses. It is only in this sense that we can speak of a line as visibly existing in nature at all. If the conditions obtaining here are equally to be applied to their artificial presentment on a plain surface, as I think they should—for what is a line of smoke beyond a charcoal line?—then, if we let a drop of ink fall on a piece of white paper, the blot will give the "line" of Euclid better than another drop which, instead of having been allowed to fall, has been regularly led over the paper with the point of a pen so as to copy the outline of the form assumed by the blot. Therefore, if when we speak of a line we acknowledge that we speak arbitrarily, and refer to what may be termed a cross between an invisible line and a visible superficies—or, in other words, as that which has length and breadth, and is visible—we would still have to acknowledge that the blot defined its own form and extent better than the copying outline, for in the outline we would have to decide whether it was its inner edge, its centre, or its outer edge which limited the magnitude. If Euclid's line be looked upon as the line of demarcation of two superficies, then the outline must necessarily cut off a portion of both or either. So, in everyday parlance, in speaking of a thick, or even of a thin line, we refer to that which has breadth, and is not therefore the line of Euclid. And if we employ the term a "very thick" or a "very broad" line, we may be asked whether we would consider as a line at all a very short line drawn with a very broad pencil, so as to form a square. And if we were to reply that a square mark was not a line, and a fresh mark were made by a still shorter stroke from a broader pencil, what would we say then? Are these marks lines, points, or superficies? What is a line?

Now as I want to talk about art, and not about mathematics, I will ask you, for my argument's sake, to allow me provisionally to define a line as any mark whereby more or less isolated and fractional form is visibly indicated, a compound line being a series of salient and somewhat disjointed marks.

Composition, disposition, position, and pose, differ only in degree. They all mean arrangement, and the first mentioned includes all the rest. Composition will not allow us to deal with the position of a man as a thing of legs and arms, save after we have determined the disposition of himself and his surroundings with regard to the shape of the enclosing space wherein he is to be posed or placed. Neither will it allow us to deal with the direction of any curve or line of direction or leading line, no matter how important, until we have roughly settled the disposition of the masses of light and shade which I wish for the time being to call principal lines (points or regions) of position. But in so far as the supposition of the existence of the smallest line gives rise to many points, so inversely from the multiplicity of these lines of position there is formed at last one line of direction, the principal line of all. With it, then, we have first to deal.

But let us see that we have thoroughly realised its existence. The eye involuntarily goes straight to the region of greatest contrast, and where a number of salient patches of strongly contrasted lights and shadows congregate, there must the eye wander. If these patches (lines of position) are all approximately of the same brilliance, size, and shape, our glance roams restlessly to and fro in search of some point of attraction greater than the rest, and if none be present, which will possibly be the case where the lines of position have been allowed to fall at random, it will seek to discover some constellation, and, having found one, will then go jerking backwards and forwards among the points like a weaver's shuttle, laboriously and vainly striving to gyrate among them, instead of dashing about like a newly-caged bird struggling to escape.

Though somewhat mixed, this metaphor allows us very easily to form an idea of the different way in which the eye will be affected by a picture of a nice clean long straight broomstick, standing erect, as opposed to the feeling produced by the contemplation of an oriental willow-wand reposing.

Possessing some thought which he deems worthy of being embodied in a picture, the first aim of the artist is to subordinate the brilliance, size, and shape of the lines of position and direction so as to admit of the formation of one leading broad, irregular, and somewhat disjointed curve composed of them all.

His next thought is where in the space he has allowed himself he shall place this curve. This he will determine by the place in this principal line of direction occupied by the principal line of position; which must be that possessing the greatest contrast in portraiture—the head or a part of it—and, by its salience, considered in relation to other points of minor interest. This line he places near the centre, and to the right or the left, as the exigencies of the occasion may require, but always above the centre. How far above will depend upon how much of the body is seen, and whether an arm forming a line of direction, or affording a line of position in the principal curve, rises above the head. In dealing with a bust, for the same reason, where the face, the principal line of position, is fronting the spectator, there will be little variation in the amount of space on either side, but when in profile the additional attraction given to the eye necessitates a greater amount of space in front of the face than behind the head; this is simply equivalent to placing the principal line of position where it was before. In the same way, if the face is looking in one direction and the body is turned in another, the principal line of direction will suggest a curve like that of the letter S, and the entire head will again be brought nearer the centre to allow the principal line of direction (S) to occupy its true position in the enclosing space.

Parenthetically, since I have made use of one letter of the alphabet, I may as well give a list of the letters and figures which, classed according to their suitability, and want of suitability, to form principal lines of direction, I once drew up in illustration.

1. Suitable types :—

G Q J S, c s g a e t f, 9 6 2 5 3, & ?

2. Unsuitable types :—

T X K E L I O, 8 4

The remaining letters and figures are either repetitions of those already used, are inapplicable as tending to confuse, or else, like A V W and M, imply a treatment of composition foreign to that in hand, and, to my mind, less simple (I refer to the pyramidal scheme). The sign indicating the bass clef in the musical staff is perhaps the most suitable of any, and the sign indicating the treble is certainly the most beautiful. As I have stated that the arrangement of the disjointed principal line of direction, and its relations to other minor lines of the same kind and to lines of position, can be inferred from the fundamental laws which define the beauty of a single simple line, I will postpone further consideration of the most suitable curves it may assume till I come to touch on beauty of feature. One fact of extreme importance should, however, be noted: the principal leading line must—absolutely must—return into itself, *e.g.*, c & s.

(*To be continued.*)

INSTANTANEOUS STUDIES.

No. 6.—THE DISTINGUISHED AMATEUR.

Distinguished Amateur. You don't mind carrying the apparatus?

Photographer. Oh, dear no; not at all!

D. A. What had I better photograph—that cottage by the river side and the trees beyond?

Photo. Yes, if you like. I think you had better get that punt into the picture, and the lad who is fishing.

D. A. Ah, of course. Perhaps you wouldn't mind sticking up the camera where you think best.

Photo. Not at all. Just here would be a good place. Would you like to focus?

D. A. No, thanks. It's such a bother to know exactly when the thing is sharp, and the focussing cloth ruffles one's hair so. Don't you find it does this?

Photo. Oh, I'm pretty used to it.

D. A. Of course. Well, will that point of view do?

Photo. Yes, very well indeed. I'll put the dark slide in, and perhaps you'll pull the trigger when I've drawn out the shutter.

D. A. Oh yes, you'll tell me when you're quite ready?

Photo. Now, if you please. Thank you.

D. A. I should like to see my photographs as soon as possible. Let me have proofs as soon as you have developed the negatives and printed from them.

Photo. Certainly.

D. A. Oh, by the way, I should like to show my friends that I've improved, so make them a little better than the last.

Photo. I understand.

D. A. How many times have I been out with you?

Photo. About three, I think.

D. A. Well, isn't it time that I exhibited my work somewhere? A lot of my friends have shown their photographs, and they don't know a bit more about the art than I do.

Photo. Whenever you like.

D. A. Thanks. [*Exit Photo*]

D. A. Jolly fascinating study; and not difficult. I can't see why fellows should make such a fuss over being skilled photographers. Why, what can be easier than pulling that instantaneous trigger? All you've got to take care of is that you don't shake the camera. I shall go in for a medal next year.

Patent Intelligence.

Applications for Letters Patent.

878. Henry Rock, 26, Pond Street, Sheffield, for "Photographic burnishing by the cold roller process, &c."—20th January, 1887.

899. Frederick Charles Bradley, 52, Chancery Lane, London, for "Improvements in photographic cameras."—20th January, 1887.

973. Markham Eeles Teynham Sherwill, 34, Southampton Buildings, London, W.C., for "Improvements in apparatus for holding, exposing, and removing dry plates or films in photographic cameras."—21st January, 1887.

1079. Claude Raymond, 169, Fleet Street, London, for "Improvements in obtaining prints with the aid of photography, and in the preparation of the materials, and in apparatus to be employed therein."—24th Jan., 1887.

NOTE ON CASTING IN PLASTER FROM PHOTOGRAPHIC CLICHES.

BY THOMAS STOCK.*

It is sometimes desirable to convert a photograph (say of certain of the "Microzoa)" into a plaque, which can be mounted on a tablet and exhibited in a case. This can be done by taking plaster casts from reliefs in gelatine. They are producible in two ways:—1. On the commercial dry plate; 2. On *cliches* of bichromated gelatine.

1. On the commercial dry plate. I have experimented with a few makes, but find the gelatine too soft in most cases. One make (possibly containing bichromate) gives tolerably good results, but different batches differ in their power of resisting the rather severe treatment to which they are subjected. The treatment is quite simple, and consists of dipping the plate (it must not be alumed) for a few moments in water, kept at a uniform heat of 90° Fahr. by an automatic gas regulator. I should think that a plate could be put on the market suited to this particular purpose, and its utility in the various photomechanical printing processes would ensure a steady demand for it.

Whilst the relief is still moist and at its best, pour on No. 1 plaster, as in ordinary plaster casting, mixed with a little alum to harden it. When dry the plaster leaves the gelatine without much trouble, no lubricator being needed. The resulting cast may of course be coloured if desired.

2. On bichromated gelatine. This method is well-known. It has the great advantage of being capable of giving a higher relief, if required, according to the thickness of the gelatine. On a moderately hard gelatine hot water may be used, a fact known almost as long as photography. A little caution must be exercised in the choice of a subject. Their microscopied sections are for obvious reasons unsuitable where strict accuracy is required; but when the lights and darks of the *clichés* (upon which intaglio and relief depend) nearly correspond to the real intaglio and relief of the object photographed, the resulting cast will of course be accurate as well as beautiful.

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* A Communication to the Edinburgh Geological Society.

Correspondence.

THE WORK OF A PHOTOGRAPHIC SOCIETY.

Sir,—At the November meeting of the Newcastle Photographic Society, I had occasion to complain of the difficulty I experienced in getting from members papers for discussion; I also stated that the Society had already covered, to a great extent, subjects of photographic interest. In sending a report of the meeting to the journals, I did not consider it necessary to give my own remarks *in extenso*, but as I find that the very short and condensed report has been made the subject of criticism in a paper by Mr. Forgan at a meeting of the Edinburgh Society (which I only noticed a week or so ago), I think some good may be done by an extended report in the form of a paper to the photographic journals of my remarks on that occasion.

I do not propose to criticise Mr. Forgan's remarks *seriatim*, when I say that our Association, since its institution in January, 1881, as will be seen from the published reports of its proceedings, has been favoured with papers on such subjects as "Lightning Photography," "The Washing and Permanence of Silver Prints," "Photomicrography" (twice), "Carbon Printing," with practical demonstrations (twice), "Dark-room Illumination," "Platinotype Printing," with demonstrations (twice), "Transparency (lantern) Making" (twice), "The Oxyhydrogen Limelight, Ethoxo Light, &c.," by the Rev. T. F. Hardwich (four times), "Demonstrations of Printing with Ferro-Prussiate," and similar papers, "Photo-lithography," "Photography in Natural Colours," "Chemistry of Development," "Enlarging," "The Recovery of Residues," "Landscape Photography for Amateurs," "The Permanence of Prints," "The History and Results of Improvements in Photographic Lenses," "Artists *versus* Photographs," "The Daguerreotype Process," "Pinhole Photography," "Retouching," "The Advantages of Technical Education in Photography," "Gray's Omega Paper," with demonstration, "Art in Relation to Photography," "Processes of Photography in Natural Colours," with demonstrations; "Photo-spectrographic Analysis," &c. Add to this list incidental discussions on other matters, such as the "Photographing of Interiors," "Orthochromatic Photography," "Enlarging on Bromide Paper," "Collodio-Bromide and Collodio-Chloride Work," &c., and I think my statement will be found fairly correct.

I gave a further list of subjects which would be suitable for discussion or papers, viz., the wet process, dry plate processes with the silver bath, gelatine and collodion emulsion processes, and the principles involved in each; the theory of development by the acid and alkaline methods; the theory of intensification; printing in silver and other metals; toning and fixing; the collotype and powder processes; the calotype process; Woodburytype, stannotype, vitrified enamels; special applications of photography to engraving typography; special applications of photography to astronomical and microscopical purposes, as well as for recording meteorological and other observations. I also referred to the questions given at the last examination in photography of the City and Guilds of London Institute, as affording further food for reflection and elaboration.

Our Society owns a small library, easily accessible to members, and I am quite certain that material for more than one paper or lecture is to be had from a perusal of any one of the volumes of the *News* or *Journal* of the past twenty or so years.

I hope that the list of subjects given above may be useful to those of your readers who may be members of photographic associations. Any additions thereto I, for one, should be thankful for.—I am, yours, &c., J. Pike.

FIRE INSURANCE.

Dear Sir,—I notice in this weeek's News you have again called the attention of photographers to the very high rate they continue to pay for an imaginary risk (for such it is) to the insurance offices. You ought, and I feel sure you will receive a very large number of thanks from photographers of every grade for bringing the case of your correspondent so well before them. I think, sir, it must rouse them to action.

You justly observe that no individual cases are likely to make a change, although your case in point proves the contrary. I think a very little combination of the right men would, if they approached the insurance offices in a fair and business way, meet with a suitable reception, and I think such a body of gentlemen would listen to their reasonable demand.

But, sir, my object in writing you was to give you a few particulars of my own case. I have for several years paid seven and sixpence per £100. Some time ago my attention was aroused by remarks made by some friends of mine when speaking on the subject, in consequence of which I named it to the agent of my office. He brought the matter before the office, but from that time I have not heard anything, and as the date of my insurance is past, I presume they do not intend to listen to at least any individual case.

It is quite reasonable for them to charge extra for wood and glass studios, but as there is no more risk of explosive matter than in any other house or building, I think they will deal fairly with any representative body, if approached in a proper way.—Yours very truly, J. Kennerell.

High Street, Wisbech.

A REMONSTRANCE.

Sir,—I observed a note in your issue of January 14th, in reference to an article of Mr. A. Pringle in the *British Journal of Photography* of January 7th. I do not intend to propose the publication in your pages of my views on the subject; anyone interested in the issue may read what has appeared and will appear in the *British Journal of Photography*.

I wish, however, to point out to you the singular unfairness of your remarks; or, rather, of your method of putting the matter before your readers. To begin with, I am not the only "trader and commercialist" who has "asserted with singular vehemence the permanency" of the prints, the gradation of which he controls ("singular vehemence" being, I suppose, a synonym for reiterated assertion).

Secondly, Mr. Pringle has shown, in the article alluded to, that the platinotypes, such as were in his possession, were less affected by sulphuretted hydrogen than the carefully made bromide prints.

Presuming, for the sake of argument, that the experiments were satisfactorily carried out, and that right conclusions were drawn therefrom (see ulterior correspondence in *British Journal of Photography*), why is there an attempt to make an *exposé* in the case of platinotype, while no mention is made of the damage done in a similar manner to the bromide prints, for which a similar claim has been made.

If Mr. Pringle's statement is damaging to the reputation of platinotype, it is at least equally damaging to the assertion of permanency of the bromide paper.

Perhaps you would say that the permanency of the prints is not disputed or in question; that attention is directed to merely an alleged sulphurising, of which the Platinotype Co. had denied the possibility. But, if so, why the implied suggestion of want of permanency by bringing in Dr. Monckhoven's ideas?

As for Dr. Monckhoven's views: he thought that common salt and salt in the air would attack the image of platinotype; that was his particular and peculiar fad. Certainly an exceedingly strange one for a man with any claim to scientific knowledge to hold.

If, instead of making one-sided remarks (when your position calls for extreme impartiality), you would try various experiments in platinotype and other processes, as Mr. J. J. Spiller did in the case of platinotype, and would publish the result without favour or bias, you might convince yourself of the true state of the case; and the knowledge gained would prevent the penning of any such note in future. But even without the knowledge, as I have shown, you might be fair.

I direct your attention to three letters which appear on the subject in the *British Journal of Photography* of Jan. 14th, as well as to those which will appear in subsequent numbers. I think that a "change" will "come o'er the spirit of our dream" on reading these.

I deny that a properly produced platinotype print is affected by even so strong sulphuretted hydrogen as that used by Mr. Pringle; and if anyone cares to learn how to produce such prints, I can show him the way.

Surely there is need for "singular vehemence" when one has to fight one's way alone through all kinds of opposition? Mr. W. Adcock rightly said recently that no process (of value, of course) had experienced so much opposition as platinotype has done; and, I may add, captious criticism.

But, just as the Platinotype Company have led public opinion and proved its views to be soundly based in the matter of the appearance of the prints, so will it overcome all opposition upon the question of their permanency.—I am, sir, yours faithfully, Herbert B. Berkeley.

TESTIMONIAL TO MR. GLAISHER.

Dear Sir,—Permit me to avail myself of your courtesy to inform your readers that the members of the Photographic Society of Great Britain whose names are appended to this letter resolved themselves, in October last, into a Committee to carry out a wish general in the Society, that the eighteen years of important service rendered by its President should have some public recognition. It came to their knowledge that a model in clay of our venerable President's head had been made by Albert Toft; this was inspected by some of the Committee, and on the 14th of October a plaster cast from the clay was ready for a meeting of the Committee. Mr. T. Sebastian Davis occupied the chair, and on the motion of Fras. Bedford, seconded by Wm. England, it was unanimously resolved "That a testimonial to the President should be in the form of a marble bust," and upon this resolution the work has been commissioned and executed.

A circular was then issued to the members of the Society; a limit of one guinea was set to subscription; and letters of approval, enclosing substantial signs of it, came freely to hand, and, indeed, but for the winter holiday of an active member of the committee, the whole project might have reached fulfilment in December.

I wish simply now to announce, as a matter interesting to the photographic world in general, that Mr. Glaisher has accepted an invitation to a dinner to take place on Monday evening, January 31st, at the Holborn Restaurant, when the bust will be presented. The Committee invite all members of the Society, irrespective of subscriptions. Happily the invitation to be present necessarily includes the lady members of the Society, and specially warrants a welcome to the lady friends of subscribers and members who will please to grace the occasion with their presence.

Tickets for the banquet can be obtained of myself, or of any gentleman of the Committee.

W. S. Bird, Secretary and Treasurer.

74, *New Oxford Street, W.C.*

Committee.—Captain W. de W. Abney, F.R.S.; G. L. Addenbroke; William Bedford; Francis Bedford; W. S. Bird; James Cadett; B. Francis Cobb, F.R.A.S.; William Cobb; Edward Cocking; T. S Davis, F.C S.; W. F. Donkin, M.A.; A. E. Durham, F R.C.S.; William England; Thomas Fall; Payne Jennings; Edmund Hyde; Francis Ince; J. Lafayette; H. S. Mendelssohn; Joseph Paget; H. P. Robinson; J. R. Sawyer; Henry Stevens; Col. H. Stuart-Wortley; J. W. Swan, F.C.S.: J. Thomson, F.R G.S.; Leon Warnerke; H. Trueman Wood, M.A.

THE AMATEUR PHOTOGRAPHIC ASSOCIATION.

Dear Sir,—I think most of your readers will agree with me that the subjoined letter is a most unwarrantable act on part of the A. P. A., and that things have come to a pretty pass when a member of a club or an association cannot "express dissatisfaction" with the management without being kicked out.

It was early in 1885 when I first "expressed dissatisfaction," but it was not until the beginning of 1886 that the matter was brought to the notice of the Council.

On June 4th, 1886, I paid my subscription—due, by the rules then in force, on the 1st. On the 15th of the same month a circular was sent to me, stating that date of payment of subscriptions had been altered from June 1st to January 1st; but it was not until January 20th, 1887, that the Council (?) found out they wanted to have nothing more to do with me.

Of course I shall not let the matter rest here, and have written to the Hon. Secretary to say that I insist on my allotment negatives being received, and shall claim all the privileges to which a member whose subscription has been paid and accepted is entitled.—I remain, yours truly, S. P. Talbot Nicholl, Lieut.-Colonel.

St. Hilary, Cowbridge, South Wales, Jan. 24th.

Dear Sir,—I am directed to return your negatives, as the Council did not expect to receive any further contributions from you after the great dissatisfaction expressed by you respecting the Society.—I am, dear sir, yours very respectfully (Signed) Arthur J. Melhuish, Hon. Sec.

12, *Old Bond Street, London, W., Jan. 27th.*

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Dear Sir,—Allow me, on behalf of the local committee, to tender you our best thanks for your good wishes expressed in this week's News for the success of the forthcoming Convention, to be held in Glasgow on the 4th July next. All the same, I, for one, will not consider it the success it should be if we have no more than already stand on the list as members of the council and local committee. I may, nevertheless, inform you that a great many who cannot spare the time necessary for committee duties have enrolled as members of the Convention, and whose assistance and interest we shall get when the time comes round. Give us your powerful aid in this matter, and lovers of photography will have nothing to be ashamed of when the "great gathering" comes off in the commercial capital of Scotland. Around our smoky city we shall be able to show our friends from the south some of the loveliest scenery in the world, all within easy distance. An hour's ride will take them to the "Modern Athens," where I doubt not that under the guidance of Mr. Pringle, they will easily find food for hundreds of cameras. Again thanking you for your good wishes, and trusting your anticipations of the Convention of 1887 may be fully realised, I am, yours truly, John Stuart,

Chairman of Local Committee.

Claverton, Helensburg, N.B., 24th January.

Proceedings of Societies.

Photographic Society of Great Britain.

The usual monthly technical meeting was held on Tuesday evening last, January 25th, in the Gallery, 5a, Pall Mall East, W. England, Vice-President, in the chair.

Orthochromatic plates formed the subject of discussion, and there was a very good attendance.

H. Dixon handed round an advertising coloured print, in which both yellow and blue largely predominated: also three negatives of the same, and resulting prints. One negative was made with an ordinary commercial dry plate, the second an orthochromatic plate of his own preparation, and the third was similar to the last, except that a screen had been employed. This was also shown; it was of a deep yellow tint, and carefully ground and polished. The process was one which his firm had worked out after many months of continuous trials, and it was not his intention to divulge the secrets he possessed. He would say that it was based upon such information as they had found in the journals.

T. Sebastian Davis: Are the plates treated afterwards, in order to become orthochromatic?

H. Dixon: Yes; ordinary commercial plates can be rendered orthochromatic.

W. Bedford: Will they keep?

H. Dixon: No; at least some will, others will not.

G. P. Cartland: Would ordinary plates be serviceable, in the usual way, after treatment, or be likely to give fog?

H. Dixon: Generally not reliable. In reply to Mr. Spurge, he said that the employment of their ordinary screen necessitated increasing the normal exposures about four times.

J. Cadett referred to Warnerke's experiments, in which it was found that some samples of yellow glass yielded as good an effect as an orthochromatic plate, but the exposure was much longer in consequence.

J. Traill Taylor said it was unfortunate if they were debarred from the use of eosine. Had anyone tried cyanine or extracts from yellow and blue garden flowers?

A member replied that he had, with promising results.

B. J. Edwards was compelled to differ from Mr. Dixon as to his working out the process, and he must say to that statement—No! The working out has been published more than once in this country, and the orthochromatic process has been found before it was lost, like the celebrated plough in the field. He then passed round a copy of Murillo's "Le Vierge de Seville," a painting which has been hitherto considered almost impossible to photograph successfully. This was now done with a Clayton and Tailfer plate. Other excellent examples were shown, including a snow scene. Continuing, he said the secret could be found in the patent specification of Clayton and Tailfer, or in the April number of the Society's journal. Eosine and enthrosine were mentioned, and there were about twenty-five to thirty different kinds known. The difficulty was in selection. Manufacturers name the different sorts alphabetically. Dr. Vogel says that pure eosine is not easily obtainable, and that goes far to explain the want of success with those who have tried the process. It was merely necessary to take so much erythrosine and anything else that one chooses make a bath, and dip ordinary commercial plates into it; but there was one weak spot, the plates would not keep. It was possible to make orthochromatic plates that would keep, however, for years by an emulsion process, and not be one whit slower. An effect that rendered colours in truer gradation marks an important advance in photography. For landscape work or in the dim light of interiors such plates, we imagined, would prove a blessing, and better effects be obtained than before. Speaking of the patent, he said that Tailfer, in a recent letter to him, wished it explained that he did not claim the use of eosine in photography—that was due to Waterhouse—but solely in its application to the gelatine bromide process. The very thing under discussion was awarded the medal at the Inventions Exhibition, and is tetraiodofluorescein, ammonia and water; the exact formula does not much matter, and the examples shown are on plates containing it in the emulsion.

W. Bedford tried Tailfer's formule and failed; he knew others who had followed the patent as well, with a like result, and he should like to hear more about these dyes.

J. T. TAYLOR asked if a patent would not be invalid if so described, that those conversant and fitted to take it up found they could not work it?

B. J. EDWARDS: Yes.

J. T. TAYLOR considered Mr. Bedford an average good photographer.

FRIEZE GREEN remarked that it was all rubbish to suppose there was nothing like eosine for the purpose. There was a lot to be found out yet. He was surprised at the beneficial result of adding beetroot juice to an emulsion.

J. B. B. WOLLASTON objected to discussing patent laws before the Society. He then showed two small copies of paintings made with commercial plates.

W. E. DEBENHAM said a member at the last meeting put forward the idea that orthochromatic photography was nonsense, and the bubble had been pricked. Since then, he had made a bromide emulsion containing eosine, copied one of the Christmas pictorial illustrations, "Sweets to the Sweet," and now passed round the result. Instead of a yellow screen, he coated the inside surfaces of his lens with aurine-stained collodion, which made no difference in the focus, as a yellow screen would do. He agreed with Mr. Dixon that cracks almost disappeared in copies of paintings; and it might be explained, when a screen were used, by supposing all light reflected from the cracks to be white, and thus, in passing through the screen, become equal to the yellow emanating directly from the yellow surface of an old painting. He understood the patent claim of Clayton and Tailfer was only for eosine in conjunction with ammonia. He used eosine without ammonia. When both sensitizer and screen were used, the best effect was obtained. Ives' process was a very good one. In Germany, enquiries were made into the utility of a thing before a patent would be granted; and, as a patent had been refused to Clayton and Tailfer, there were, he presumed, good reasons.

J. SPILLER, as one of the jurors of the International Inventions Exhibition, took a share of responsibility in awarding the medal. He considered the results were clearly an advance, and so did his brother jurors, all of whom were members of the Society. In the specification, now four years old, eosine and ammonia are clearly stated. Supposing eosine to be required on a large or small scale, it can easily be obtained pure, and in quantity. One reason for the different results spoken of might be due to a possible interchange with chloride, bromide or iodide of silver under certain conditionc, some samples of eosine being more prone to the change than others. As the pink tetraiodofluorosciene had been mentioned as the best, and that it it is so it can always be obtained of equal purity.

B. J. EDWARDS showed a convenient plan for holding stained collodion films. It was a plate of thin sheet zinc sandwiched, and cut to the shape of a diaphragm; the stained film slipped inside and was used in the stop slit between the lenses. He said it was a good way to get over the difficulty of yellow screens.

Before the meeting terminated, Mr. DIXON stated that he does not use eosine in his process.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

THE first lantern meeting at which ladies have been especially invited was held on Thursday, January 20th, the Hon. Secretary, J. J. BRIGINSHAW, presiding.

Besides the display of several excellent transparencies upon a small but brightly-lit screen, a few microscopic objects were shown by means of Newton's new lantern attachment, and ranged upon an adjacent table there was mounted a whole battery of microscopes, comprising nearly every known adjustment in use, including incandescent electric lighting from storage batteries.

At suitable intervals the company were entertained by members and friends with song, recitation, and piano; the evening's proceedings terminating with a dance.

EDINBURGH PHOTOGRAPHIC SOCIETY.

THE third meeting of the current session was held in 20, George Street, on 5th January, at eight o'clock. The President occupied the chair.

H. BREBNER read a paper on "Beauty in Pose, Proportion, and Feature in Portraiture" (see page 57). He illustrated his remarks, and added to their interest by outlines and sketches on the blackboard.

S. TAMKIN sent a short paper on "Photographic Society Table Talk," which was read.

A roll-holder sent for exhibition by J. M. Turnbull was explained. It was pointed out that in this holder, no third roller is needed, the paper roll being contained in a receptacle from which it is paid out as required. The manner in which the exposures are marked off is an improvement over that of marginal prickers, which sometimes miss. Whenever the slide is drawn to expose, two perforators are released, which puncture the centre of the paper at the limit of the exposure.

F. BRIGLMEN submitted a mechanical contrivance which might be styled an adaptor front for the camera. The object of it is to furnish a handy means of holding securely in position for any temporary purpose lenses of different sizes. Two sliding metal panels with V-shaped openings are made to approach and grip the lens, so that it is held at four points; and in order to close the small openings left, a square piece of sheet rubber with a circular hole in it is fitted over the lens, and the whole kept tightly in position by elastic bands. The idea was favourably remarked upon.

A sample of a very translucent material termed "Glacier" paper was handed round, kindly sent by the makers. It was examined in view of the possibility of utilising it as a support for gelatine emulsions. It is thicker than the tissues usually employed, and was affirmed to be impervious to watery solutions.

J. G. Tunny exhibited a number of ceramic enamel portraits of great beauty and softness, which were much admired.

NEWCASTLE-ON-TYNE AND NORTHERN COUNTIES' PHOTOGRAPHIC ASSOCIATION.

THE annual meeting was held on Thursday, the 13th inst., in the College of Physical Science, Newcastle, at 7.30; J. DOWNEY in the chair. Mr. Hinton Shand was elected a member. The following officers were appointed:—

President—Prof. A. S. Herschel, M.A., F.R.S., &c., &c.
Vice Presidents—J. P. Gibson, J. Downey.
Hon. Treasurer—Mr. Laws. *Secretary*—J. Pike.
Committee—Messrs. Auty, Galloway, E. Sawyer, L. Sawyer Proctor, J. W. Robson, Sinclair, Templeton, and Schumann.

The Secretary read the Sixth Annual Report, and the Treasurer made his statement, which were passed. From the former it appeared that while nine new members had been enrolled, there had been a loss of two by death, and seven by resignation. In connection with the exhibition it was stated that the expenses were expected to be heavy, and although the Society expected to be reimbursed somewhat by the receipt of entrance fees, and could show a very fair balance, it might be necessary to make a special effort to meet the necessary expenditure. Several of the members had already contributed to a fund for the purchase of a "die," from which medals could be struck for this and any other exhibition it might be desirable to hold; but further contributions should be forthcoming before anything could be done in this direction.

The Treasurer's account showed a balance in hand of £31 19s.

A discussion followed, on "Orthochromatic Photography."

RE-ORGANIZATION OF THE NORTH LONDON AMATEUR PHOTOGRAPHIC ASSOCIATION.

A NUMEROUSLY attended meeting was held on Tuesday, the 18th inst., at Myddelton Hall, Islington, for the purpose of taking into consideration the advisability of re-organizing the above Society, and establishing it on a broader basis; J. TRAILL TAYLOR occupied the chair.

On the motion of J. Humphries, seconded by F. W. Cox, it was resolved to re-organize the Association under the title of the North London Photographic Society. The proposed rules of the new Society were then read, and, after an animated discussion, in which Messrs. Clifton, Cox, Coventon, Few, Hiscock, Mackie, Medland, Oakley, Spencer, G. Smith, H. M. Smith, the Chairman, and others took part, were, after sundry modifications, agreed to.

The principal features in the re-organized Society are, briefly, as follows:—An annual subscription of 10s.; bi-monthly meetings on the first and third Tuesday in each month; the Society to be open to both professional and amateur photographers; the points arising in the every-day practice of photography to be discussed in preference to the more abstruse questions which are so fully dealt with by the older societies, with a view to making this Society as far as possible a practical school of photography.

The following were elected as officers:—

President—J. Traill Taylor.

Vice-Presidents—Alexander Mackie and J. Humphries.

Curator—E. T. Hiscock.

Council—Edgar Clifton, F. W. Cox, W. T. Coventon, W. Few, L. Medland, J. Oakley, F. G. Reader, and Geo. Smith.

Hon. Secretary and *Treasurer*—Hedley M. Smith, 5, Beatrice Road, Stroud Green, N.

The Hon. Secretary will be glad to receive the names of gentlemen wishing to join the Society. Demonstrations and papers for several meetings have already been promised. The next meeting will take place at Myddelton Hall, Upper Street, Islington, at eight o'clock on Tuesday, February 1. Visitors are invited.

CAMERA CLUB.

On the 20th inst., the subject under discussion was "The Development of Bromide Paper," opened by the reading of a communication from Andrew Pringle (see page 64). Dr. J. **Foulerton** occupied the chair. A large number of film negatives and positive prints, sent by Mr. Pringle to illustrate his remarks as to the capabilities of bromide paper, were handed round for exhibition. The prints were on all makes of paper. Previous

Mr. **Kidd** said his experience tallied, in most respects, with Mr. Pringle's, but he did not advise the use of an excess of bromide to give density. A small amount of bromide gave best results, a better colour, particularly. Increase of bromide caused a brownish-green colour. If from over-exposure a great addition of bromide became necessary, that print would not be of much use. With a dense negative, a smaller proportion of iron to oxalate should be used. He did not use acid after development, but found a plug of cotton wool, if used skillfully, and with all thoroughly in soak, rubed off the developer, and prevented precipitation of lime in the paper. As the original introducers of the bromide paper, they had at first found the black colour much objected to; now, nothing but engraving colour photographs would be looked at. The colours given by albumenised paper were not approved by artists and people of cultivated tastes.

Herbert Fry said he thought great care was needed in getting rid of the acid before fixing, as a very injurious sulphur action might be set up in the fixing, if acid remained in the print. The acid bath was not absolutely necessary. He considered that it was important that development should be prompt, and that bromide be not used in excess, if soot and whitewash effects were to be avoided; also that, in exposure, distance from the light should be carefully considered, and regulated by the strength of the light and the density of the negative.

Mr. **Harman** said that the acid bath was absolutely necessary to prevent the precipitation of oxalate of iron in the pores of the paper. The picture, too, was more brilliant from the acid treatment. He then made some interesting remarks on alpha paper. It was slower than bromide ordinary, but gave great range of colour. When the objectionable greenish colour came, it was a sign of no toning action.

Mr. **Walker** agreed that the acid bath was needed, at any rate, in America. He had intended showing some sensitometer tests, exhibiting density curves, to rebut the assertion that half-tones were not obtainable on bromide paper, but had been prevented carrying out his full intention. Some prints by M. Nadar, of Paris, showing every graduation and great detail in the shadows, were exhibited.

Dr. **Foulerton** preferred to use magnesium wire in exposure, rather than paraffin or gas, and he placed his printing frames round in a circle, exposing all together at one illumination.

Mr. **Ferrers** said he also preferred magnesium wire, as giving more even tone, but found that exposing in a circle caused objectionable reflections across from one negative to another.

Mr. **Davidson**, referring to Mr. Kidd's remarks, thought that it was the glaze, rather than the colour, in albumenised paper prints, that was objected to by artists, or by anybody who looked for "quality" in pictures, and that photographs on plain salted papers, and papers of matt-surface generally, rendered the feeling of a subject much more effectively than the ordinary albumenized paper. Colour was a matter of taste, but he preferred a warm coloured print, when it was not crude. For this reason, he went greatly for alpha paper. It did not, in his hands, appear to give a certainty of obtaining warmth, though a grey could be got at will. He found his toning bath had to be much stronger in gold than that recommended, or else the greenish appearance remained.

W. H. **Wheeler** said he found, from his experience amongst artists, that the colour of a monochrome was a matter of individual taste, the glaze of a silver print being the point of objection. Etchings of a brown colour were now highly appreciated, and a painter, in doing work in monochrome, greatly used sepia.

Great interest was excited by the exhibition and working, by Mr. Spickernell, of one of Marion's (Urie's) automatic printing machines.

The paper for 3rd February is "Artistic Photography," to be read by W. H. Wheeler.

SUTTON SCIENTIFIC SOCIETY (PHOTOGRAPHIC SECTION).

The photographic sub-committee of the above Society gave a most successful soirée on Thursday, the 20th inst., at the Public Hall, Sutton. About four hundred and fifty visitors attended, and seemed greatly to appreciate the efforts which were made to amuse and interest them. In the intervals between the showing of slides in the optical lantern there was music, in the shape of glees, solos, and instrumental pieces. The geological sub-committee also kindly arranged a small geological exhibit, which had many visitors.

Three sets of slides were shown in the optical lantern under the charge of Mr. Chivers, the series by Mr. Gale earning, as usual, much admiration, from both photographic and artistic points of view.

THE SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

The first winter lantern exhibition was held December 29th, 1886, the chair being occupied by President **Beach**, who announced that Ortgies Gallery, at 845, Broadway, had been secured for the first joint exhibition of photographs, which would be opened Saturday evening, March 26th, with a private view for members and the press; and close Saturday, April 2nd. Season tickets would be issued. It was expected many choice pictures would be exhibited, and it was hoped that members would take an interest in the exhibition, and do what they could to make it a success. The regulations would be issued shortly. The President stated that 100 of the 200 lantern slides recently received from the London Camera Club would be thrown upon the screen, followed by a few made by somo of our own members.

The lights were then lowered, and the exhibition took place, the lantern being worked by Messrs. Lawrence and Mason.

IMPERIAL RUSSIAN POLYTECHNICAL SOCIETY.

At the last meeting of the section of the above Society, L. Levistsky in the chair,

L. **Warnerke** exhibited a new camera made according to his directions by Mr. Jacobson. The general form was similar to the most approved English ones, but there were a great many novel features about it. The double backs were made of mahogany on the principle of the Brandel-metallic ones. Altogether the improved features were decidedly ingenious, and the workmanship equal to that of the best foreign manufacturers.

N. **Condoyannaky** demonstrated the mode of working with the Eastman positive paper.

Dr. **Poehl** said that he had used a lot of the sort "A" instead of albumen paper for printing his photo-micrographs of the impurities contained in the water-company's pipes, and could testify to the superior results obtained by it. A number of prints on Eastman's "A" and albumen paper from the same negatives were shown, those on the former being full of minute detail which, the Dr. said, was impossible to obtain in the ordinary silver prints.

Talk in the Studio.

London and Provincial Photographic Association.—On Thursday next, a demonstration of the development of platinotype printing will be given by F. M. Edwards. Members who had prints given them for the purpose of staining, are requested to bring them to the meeting or send same to the secretary.

Eastman's Stripping Films.—On Wednesday, 19th January,

J. Jackson, of the Eastman Dry Plate and Film Co., gave a demonstration at the Birkbeck Institution of the stripping films that are shortly to be introduced. The sensitive film is supported on paper coated with a thin layer of soluble gelatine. The exposure, in the roller slide or otherwise, the development and fixing, are done as usual, and the wet negative is squeezeed down on to a glass plate previously polished, treated with French chalk, coated with collodion, and soaked until the collodion surface no longer shows any greasiness. After standing under a weight for fifteen minutes or so, the plate is put into hot water, and the paper back stripped off when it shows signs of blistering up. A skin of wet gelatine is then squeezeed on to the negative, and the whole is allowed to dry. Lastly, the gelatine surface is coated with a thin enamel collodion, and after a suitable period, cut round with a knife and stripped from the glass. The finished negative therefore consists of the developed film backed up with the gelatine skin, and a coat of collodion on each side of the gelatine. The skins used are prepared on ground glass, and are therefore matt on one surface, but the ground glass effect is scarcely visible in the finished negative.

Manchester Photographic Society. — At the monthly meeting on January 13th, A. Brothers gave an address on "Progress in Astronomical Photography," the substance of which will appear in our next. Mr. Brothers demonstrated with the lantern, and showed photographs illustrating the various matters referred to in his address. A print referred to in a passage quoted from M. Janssen's paper was illustrated by a photograph of the Pleiades, in which a nebula was discovered which had never been seen in any telescope.

The Duration of the Sun.—Professor Sir William Thomson, at the Royal Institution on Friday, expounded the latest dynamical theories regarding the "probable origin, total amount, and possible duration of the sun's heat." He called attention to the theory of Helmholtz that the sun is a vast globe gradually cooling, but as it cools, it shrinks, and the dynamic effect of this shrinkage keeps up its temperature. The total of the sun's heat is equal to that which would be required to keep up 476,000 millions of millions of millions horse-power, or about 78,000 horse-power for every square metre—a little more than a square yard—and yet the modern dynamical theory of heat shows that the sun's mass would require only to fall in or contract 35 metres per annum to keep up that tremendous energy. At this rate, the solar radius in 2,000 years' time would be about one-hundredth per cent. less than at present. A time would come when the temperature would fall, and it was thus inconceivable that the sun would continue to emit heat sufficient to sustain existing life on the globe for more than 10,000,000 years. Applying the same principles retrospectively, they could not suppose that the sun had existed as at present for more than 20,000,000 years.

The Development of Eastman Bromide Prints.—A. Pringle read a paper on this subject at a recent meeting of the Camera Club, and, after emphasising the control over the result which the judicious worker possesses, he winds up with the following remarkable dictum :—"*And the bromide prints are 'Permanent,' as permanent as any purely photographic printing process we have.*" When a man makes a definitely positive statement, which statement implies a certain and unerring knowledge over a wide field where even the best informed confess their ignorance, one cannot help thinking that there may be some uncertainty about everything that man has said and shall say. In this connection we may refer to the maxim of Malbranche, a maxim which writers and speakers would do well to remember :—"Strive after infallibility, but never claim it."

The following advertisement appears in the *Photographic Times* :—

> WANTED—Address of photographer who took instantaneous view of the steamships *Britannic* and *Beaconsfield* at the time of collision off the Battery, New York City, Nov. 19th ult. Address P. O. Box 3646, New York City.

Photographic Club.—The subject for meeting on Feb. 2nd will be "The Photographic Uses of Artificial Light."

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C. ;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E C."

W. Burns.—We shall be better able to judge of its merits when we see it.

J. B. Smith.—We do not know of any means. Indeed, if such means were found, the discovery would be one before which the greatest physical advances of the age would seem small. Even though the hope seems small, one should not be deterred from working.

Nitrate.—Yes; but the exposure must be a long one.

E. M.—We only promised it to you conditionally upon our receiving it, and as this has not happened we are helpless in the matter.

Hypo.—You must be remarkably simple-minded if you suppose that such a letter can be inserted over a *nom-de-plume*. Send us a short form of your letter (omitting all personal sneers and mean imputations) and we will insert it if you don't object to your name appearing.

H. S.—The Autotype Manual will serve your purpose; it costs 1s., and can be had from the Autotype Company, New Oxford Street.

Thos Stokoe.—Your picture, "After the Thaw," is one which pleases us very much, and we think that it would be much valued by artists as a study.

John Davison.—1. The address of the Company is 31, Farringdon Street, London. 2. You cannot do better.

Cambrian.—Quite as well, and, indeed, better, considering what you say about your special requirements.

J. Haswell.—If the firm still exists, the address on your letter will be quite sufficient, so we post it without addition. In France, the postal administration is not worked quite on the same system as in this country.

R. Foster.—We really do not know to what you refer; can you give further details?

C. S. Hyason.—If each of the pictures grouped upon the card is legally your own, and no copy of any one has been sold before the registration of the whole was effected, it is quite possible that you may be able to substantiate your copyright in each one of the pictures; it is, however, much safer to register each separately. Supposing, on the other hand, that you have merely grouped pictures in which no copyright exists, and have registered the whole grouping, you will no doubt be able to restrain anyone who copies your production as a whole; but it is very unlikely that you will be able to restrain others from using the same pictures differently grouped.

J. H. Goldie.—The address has been sent to you by post.

M. J. H.—We have taken it as "glacial," and the formula worked satisfactorily.

C. H. E.—Thanks. A note on the subject next week.

F. G. P.—Communicate with the police, and they will make enquiries. It does not follow that because a man advertises in the Photographic News, he is therefore to be trusted.

W. Fred. Mitchell.—1. It is not a very satisfactory thing to buy ready-made, as it becomes oxidised and weakened. Still, Hopkin and Williams, Operative Chemists, Cross Street, Hatton Garden, will doubtless supply it. 2. The second one given on page 195 of the Year-Book.

Collotype.—1. An ordinary typographic press, unless the plates are large, when it is better to use a lithographic press. One made on the Continental plan, with a roller, instead of a scraper, is generally preferred. 2. There is not one in English.

J. J.—The size mentioned is a suitable one for general work, and it will be quite sufficient to glaze the north side and the north slope.

T. K. C.—We cannot give sufficient details here to be of much use to you, so you had better obtain Robinson's "Studio, and What to Do in It," and read the first portion. The book costs 2s. 6d., and is published by Piper and Carter.

W. H. B.—1. Rather a small amount than a large, and do not fail to give a good exposure, and restrain the development if necessary. 2. Rather dark. 3. Certainly it would be an advantage, provided the plates are good of their kind.

Lens.—Perhaps you refer to O. Schölzig, of 9, New Bond Street.

J. Bailey.—We congratulate you on your success.

J. M. Tarland.—It is one of those forms of fog which hang on the skirts of the wet process, and you must go systematically to work to find the cause. A few words of advice would be useless, and you had better obtain Abney's "Instruction in Photography," published by Piper and Carter; the cost is 3/6.

Chrome.—1. The rubber rollers are made under the control of and sold by the proprietors of the *Daily Telegraph*. Write to the roller department, at the office in Fleet Street, London. 2. The book we recommend is "Das Gesammtgebiet des Lichtdrucks," by Husnik, published by Hartleben, of Leipzig. It costs under five shillings, and can be ordered of Trübner and Co., foreign booksellers, Ludgate Hill, London.

E. Dosseltee.—The breaking up of the line is very likely to be the result of using too thick a film of bitumen.

In a Fix.—You had better go to one of the first-class makers, and so get a really satisfactory instrument.

THE PHOTOGRAPHIC NEWS.

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THE AUER-WELSBACH INCANDESCENCE LIGHT.

The light of an ordinary gas or candle flame is commonly believed to be radiated from solid particles of carbon which are intensely heated by the flame; and if this be so, the usual gas flame is a tolerably strict analogue of the lime-light burner, in which a non-luminous but intensely hot flame heats a portion of the cylinder of lime until this glows brightly.

Now, many persons have realised the circumstance that the lime cylinder or block, as ordinarily used, is very disproportionate in size to the flame that heats it, a condition of things which involves considerable loss of heat by radiation from those parts of the lime block not heated to incandescence. When zircona was introduced some twenty years ago as a convenient and more lasting substitute for lime, the question of reducing the size of the incandescent material was considered, but without much immediate practical result.

Since then, however, it has been found that if the incandescent earthy body be reduced very much in size, and it be made of suitable form, the flame of an ordinary Bunsen burner will serve to bring it to a state of high incandescence; and this is illustrated very strikingly in the latest form of incandescence lamp, that invented by Dr. Auer von Welsbach.

Lime is out of the question when the incandescent body takes the form of a network, as in the case of the Welsbach light, and Dr. Welsbach employs a mixture consisting mainly of zircona and lanthana, but some of the rarer earths are advantageously used in conjunction.

Dr. Welsbach soaks a lightly woven tube of cotton netting—the skeleton of an ordinary argand wick—in his solution of earths, and mounts this so that an ordinary Bunsen flame plays through it. Of course the cotton burns away immediately, and the earthy net-work that remains becomes brightly incandescent, giving a white and brilliant light like the ordinary lime light.

On Monday evening last we visited the Marlborough Gallery in Pall Mall, which is now lighted with the Welsbach lamp, and were much pleased with the result.

It is said that the earthy net-work will last from 800 to 2,000 hours, when it can be replaced at a cost of about one shilling.

From the white colour of the light, one would suppose the Welsbach lamp to be specially adapted for photography at night, and for use in the enlarging lantern; and we hope before long to be able to give our readers further information as to this matter.

A lamp consuming two feet of gas per hour gives a light equivalent to about seventeen standard candles; but one may safely conjecture that the photographic intensity would be several times this.

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.C.S.,*

Senior Assistant Lecturer on Chemistry and Lecturer on Photography in the Yorkshire College, Leeds.

One of the most serious defects of photography with ordinary gelatine or collodion plates is that it does not give images with true gradations—that is, with the same degrees of relative brightness that they seem to possess to the eye. In other words, photographic effect does not coincide with optical effect, and the tones of the photographic images are incorrect. This fact has been clearly recognised for some time, and of late years considerable attention has been paid to the relation between colour and photographic effect, with particular reference to the rendering of landscapes, portraits, pictures, and coloured objects generally, in correct gradations. In fact, this problem disputes with photo-mechanical printing processes the honour of being the most important photographic question of the day. It seemed, therefore, that a fairly complete account of the present position of our knowledge of this subject would not be without value, even though the writer has little that is new to contribute to the solution of the problem.

In order to make the argument complete, and more especially for the benefit of those readers whose acquaintance with experimental physics is limited, it is desirable in the first place to summarise the generally accepted views concerning light and colour.

Light is a *sensation* due to the communication of certain kinds of vibratory motion to the retina of the eye, and thence to the brain. This motion originates in the ultimate particles or molecules of luminous bodies, and is communicated to the ether, an imponderable but highly elastic medium which pervades all space and fills up the interstices between the molecules of matter. The motion is transmitted through the ether in the form of an undulation or wave, in much the same way as a shake will travel along a rope in the form of an undulation. When the waves thus travelling through the ether impinge upon the eye, their motion is communicated to the nerves and produces the sensation of light. It is very important to bear in mind that light is a subjective phenomenon, a sensation; and that what we commonly speak of as light, or a ray of light, is simply wave motion until it has impinged upon the retina. If the waves impinge upon and communicate their motion to other substances, the result depends on the nature of the particular substance, and may take the form of the development of heat, or the production of chemical changes. For the sake of convenience I shall use the term light to denote the sensation, and the ordinary expression ray of light or beam of light to denote wave motion in the ether, which may or may not produce light according to circumstances.

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When a beam of ordinary white light is passed through a triangular piece of glass known as a prism, the beam is not only refracted or bent out of its course, but, instead of the original white light, we get a coloured band which is known as the spectrum. If by suitable means the different parts of this band are again brought together at one point, white light is reproduced. These experiments show that an ordinary beam of white light is really composed of rays capable of giving rise to a number of different colour sensations, and the sensation of whiteness is the result of the simultaneous production of these different sensations. The colours observed in the spectrum may be broadly divided into red, orange, yellow, green, blue, and violet, and follow one another in this order. When the phenomenon is closely examined, it is seen that the red rays have been the least refracted or bent out of their original course, whilst the violet rays have been refracted to the greatest extent. Adopting the ordinary terminology, the rays which produce the sensation of red are the least refrangible, whilst those which produce the sensation of violet are the most refrangible, and the refrangibility of the others increases gradually as we pass along the spectrum from the red to the violet. Moreover, it is found that in an ordinary beam of light there are invisible rays, which are less refrangible than the red-producing rays, and these are classed as the infra-red rays. There are others, known as the ultra-violet rays, which are more refrangible than the violet-producing rays, and are invisible, but play an important part in many photographic changes. If the spectrum of sunlight is examined, it is found not to be perfectly unbroken or continuous, but is crossed by a large number of fine black lines, which are known as Fraunhofer lines. These lines indicate that certain rays in the sunlight have been absorbed before it reaches the earth; they are not found in the spectra of the lime-light, electric light, &c. The positions of the more prominent of these lines can be accurately determined, and they are very convenient points of reference when we wish to indicate any particular part of the spectrum. For this purpose they are denoted by letters, the most important being A, which is at the termination of the visible red, B in the bright red, C in the orange-red, D in the orange-yellow, E in the green, F at the point where the green passes into the blue, G in the full blue, and H at the extreme point of the visible violet. Other similar lines, which are found by photographic methods to exist in the ultra-violet part of the spectrum, are denoted by the letters K, L, M, N (fig. 2).

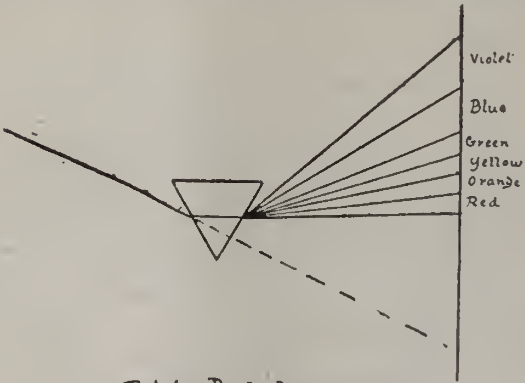

Fig 1 - Production of a spectrum

The different refrangibility of the different rays, and their power of producing different colour sensations, is due to a difference in the lengths of the waves which constitute the rays, a wave-length being the distance between the crests of two consecutive waves in the same ray. These wave-lengths are very small, but can be measured accurately by methods which are described in treatises on optics, and are usally expresed in "tenth-metrets" or ten-millionths of a millimetre. It is found that in the visible spectrum the less refrangible or red-producing rays have the greatest wave-lengths, whilst the more refrangible or violet-producing rays have the smallest of wave-lengths. The wave-length diminishes as we pass along the spectrum from the red to the violet, and continues to diminish as we pass into the ultra-violet part of the invisible spectrum; it increases as we pass below the red to the infra-red end of the invisible spectrum. The wave-lengths which correspond with the chief Fraunhofer lines are A 7604, B 6867, C 6562, D 5892, E 5269, F 4861, G 4307, H 3968.

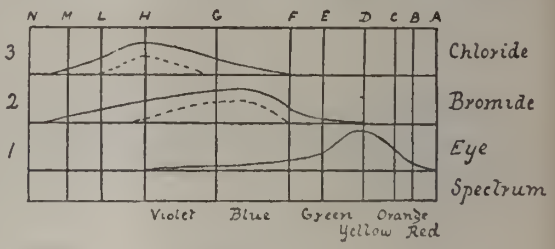

Fig 2

The different wave-lengths are due to differences in the periods of vibration of the molecules of the luminous substances. If one end of a long rope is shaken slowly, the motion travels along the rope in the form of a long undulation, whilst if the rope is shaken rapidly the motion travels in the form of a short undulation. Similarly, molecules which vibrate rapidly produce short waves in the ether; whilst those which vibrate slowly produce long waves, and those with intermediate periods of vibration produce waves of intermediate lengths.

The generally accepted explanation of the various colour-sensations is that the eye contains three distinct sets of nerves, one of which is mainly concerned in producing the sensation of red, another in producing the sensation of green, and the third in producing the sensation of violet. In other words, red, green, and violet are the primary colour-sensations, and all other sensations of colour are produced by the simultaneous excitation of two or all of these primary sensations in different degrees. For example, the red rays of the spectrum appear red, because they excite only the red-producing nerves; the green appear green, because they excite only the green-producing nerves; the yellow rays yellow, because they excite both the green and the red-producing nerves; the blue rays blue, because they excite both the green and the violet-producing nerves, and so on. Whether a given ray will produce any effect upon a particular set of nerves or not depends upon whether the motion of the ray is communicated to the nerves. Now nerves, like other substances, will only absorb those waves with which they are in unison, just as the strings of a piano will each respond to a particular note, and to that only; and hence the effect of a ray upon a given set of nerves is determined by its period of vibration, or, what amounts to the same thing, by its wave length. If a ray is not in unison with a nerve or other substance on which it impinges, the motion of the ray is not absorbed, and no effect is produced.

It must always be borne in mind that just as "light" is not light, but motion, before it impinges on the eye, so what we call colour is only motion of a particular kind before it impinges on the retina. When we speak of a red ray, we mean wave motion of a particular kind, which is capable of producing the sensation of red when it is communicated to the nerves of the eye; when we speak of a violet ray we mean wave motion of a particular kind which is capable of producing the sensation of violet, and so on. A very complete and interesting account of the various colour phenomena will be found in Rood's "Modern Chromatics," to which the reader is referred for further information.

Optical and Photographic Effect.—When a spectrum is examined, it is readily seen that different parts possess different degrees of luminosity, or produce different sensations of brightness when they impinge on the eye, and it has also been known for a long time that different parts of the spectrum act upon photographic substances to very different extents. The optical or photographic effect of different regions of the spectrum is most conveniently represented by means of a curve. The horizontal line or base represents the spectrum, and the abscissæ, or points marked off along this line, indicate the positions of the dark lines in the solar spectrum. The ordinate or vertical height of the curve above the base at any given point represents the intensity of the action at that point (figs. 2 and 3.)

Various experimenters have measured the relative brightness of the different parts of the spectrum, the latest and probably the most accurate measurements being those recently communicated to the Royal Society by Abney and Festing.* The relative brightness of the different spectrum colours is affected by the absolute brightness of the original white light, but the point of greatest luminosity is situated a little further away from the red than the line D—*i e.*, in the yellow—and the luminosity diminishes rapidly as we pass from this point to the red, and somewhat more gradually as we pass in the opposite direction towards the violet (fig. 2, No. 1.) To the eye, then, yellow, orange-yellow, and yellowish-green are the brightest spectrum colours, whilst violet, red, and blue are the darkest; and this applies with some modification to the corresponding pigments.

When the action of the spectrum on an ordinary gelatino-bromide plate is examined, it is found that the maximum action is exerted by the blue, a considerable effect by the bluish-green, the violet, and the invisible rays beyond the violet, but very little action by the green, greenish-yellow, and yellow, and practically none by the orange-red and red (fig. 2, No. 2). It is evident that the action of light waves on the eye, and on a gelatino-bromide plate, is very different, and that the very rays which exert the greatest effect on the eye are the rays which exert the least effect on the plate; whilst the rays which produce the greatest effect on the plate—*i. e.*, the blue and violet—have very little effect on the eye. In the case of silver gelatino-chloride (fig. 2, No. 3) the difference is still more marked, since the maximum effect on the chloride is produced by the extreme violet which to the eye is the darkest part of the whole visible spectrum. Here we have the explanation of the well-known fact that red, orange, yellow and yellowish-green objects, which appear bright to the eye, appear dark in a positive photographic print, whilst blue and purple objects, which seem dark to the eye, are light in the print.

The unbroken curves in fig. 2 represent the effect of long exposures, whilst the dotted curves represent the effect of short exposures. In these curves and the difference between them lies the whole philosophy of the use of yellow or red light during photographic operations. From curve 1 we see that yellow rays have the greatest illuminating power, and that, therefore, we can see much better with a given quantity of yellow-producing radiation than with an equal quantity of red-producing radiation. From dotted curve 2 we see that if the exposure of the plate is short, green, yellowish-green, yellow, and all the less refrangible rays exert no developable effect, and consequently for all operations in which the exposure of the plate is not prolonged, a yellow light can be employed with safety and advantage. If, however, the exposure is long, an appreciable effect is exerted as far as the orange, and consequently, for all operations in which plates are exposed to light for a long time, it is safer to use a red or orange-red light. However, even for somewhat long exposures, a yellow light may be employed, provided that it is kept low in intensity. As Abney has pointed out, photographic action is of two dimensions, and depends on the intensity of the light multiplied by the time during which it is allowed to act. Hence, if the intensity of the yellow light is sufficiently low it will exert no appreciable effect except after very prolonged exposure. Moreover, as has been already stated, it is easier to see with a yellow light of low intensity than with a red light of high intensity, and the former is much less wearying to the eyes.

It will be observed that all these curves are referred to a prismatic spectrum. It is much to be desired that results of this kind should be referred to the diffraction or normal spectrum, in which the different rays are separated in proportion to their wave-lengths. In the prismatic spectrum the less refrangible rays are crowded together, whilst the more refrangible rays are spread out to a much greater extent than corresponds with their wave-lengths (fig. 1), and the result is that the apparent relative effect of the less refrangible rays is increased, whilst that of the more refrangible rays is diminished.

From these facts it follows that in order to obtain photographs showing correct gradations of tone, we must so alter the character of our plates that the action of light rays upon them corresponds with the action of the rays upon the eye—that is to say, we must increase the sensitiveness to green, yellow, orange, and red, and diminish the sensitiveness to blue and violet.

(*To be continued.*)

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[*] Photographic News, 1886. *Philosophical Transactions* 1886.

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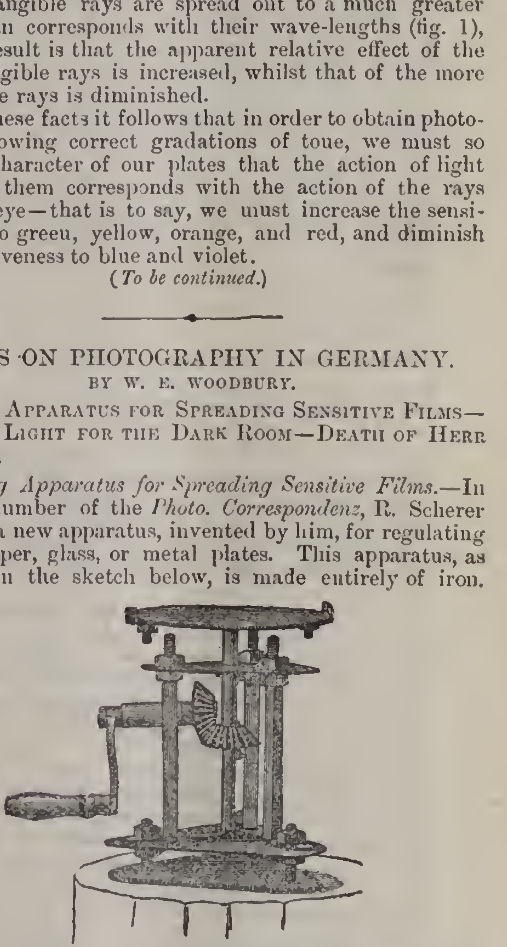
NOTES ON PHOTOGRAPHY IN GERMANY.

BY W. E. WOODBURY.

Rotating Apparatus for Spreading Sensitive Films—Brown Light for the Dark Room—Death of Herr Quidde.

Rotating Apparatus for Spreading Sensitive Films.—In the last number of the *Photo. Correspondenz*, R. Scherer describes a new apparatus, invented by him, for regulating coating paper, glass, or metal plates. This apparatus, as depicted in the sketch below, is made entirely of iron.



The round turning plate is fitted with two clamps, supplied with holding screws, which serve to fasten the plates. Any size plate can be coated from carte-de-visite size to the breadth of 25 c.c.m., and of any required length. In cases where the sensitive solution is laid on warm, the plate can be heated from underneath. For spreading on cold solutions sensitive to light, such as asphalte, no warming of the revolving-plate is, of course, necessary. To the bottom of the apparatus a strong clamp screw is fitted, by means of which the whole can be quickly fastened to the corner of any bench or table. The whole apparatus weighs only 5½ pounds, and costs ten florins. There can be no doubt as to the use of such an apparatus to the professional world, especially for Lichtdruck (Collotype), Photozincography, Heliography, &c.

Brown Light for the Dark-room.—Since the advent of the gelatine dry plate, a great many photographers have complained that their eyes have become much injured by the dark red or ruby light required to be used in development. As to the injurious effect of red light upon the eyes, and, indeed, upon the whole nervous system, I think no one can doubt, and every day the number of complaints of its destructive influence increases. The rapid change of very different degrees of light intensity is highly injurious even to the strongest eyes, and the long, steady influence of coloured, and especially of red light, has an equally disastrous effect. According to an eminent writer, even the disposition of man is variously affected by various colours. Red is found to be exciting, blue and violet soothing, &c.; thus it will be seen that it is the red which is proved to be in the highest degree exciting and discomposing for the eyes. It is an error, as great as it is widely extended, among workers with emulsion plates, that the manipulation and development of these plates must occur by the weakest possible ruby-red light. If the manipulation of dry-plates by a red light is absolutely imperative, then it must be accepted as one of the necessary and unavoidable evils of which almost every profession affords an example. I have always held that the whole question as to the most suitable medium to use resolves itself merely into the question as to what part of the spectrum to employ—red, orange, or orange-yellow—and as, by experiments made, it has been found that all three yield equally satisfactory results, it seems evident that no great improvement in this direction can be made in the future. The orange-yellow is, however, not only the pleasantest of the three, but also the least injurious to the eyes, and it therefore seems to be the one most recommended. In "Leaves from an Amateur's Note Book," by Carl Srna, he says: "After I had tormented myself for a long time with the red light, and then had taken to an orange-coloured one, I tried at last the brown light recommended by Schumann, and have found it excellent." In order to make this brown light, the dark room window and the white glass divisions of the lantern should be pasted over with some layers of what is known in this country as brown "Seiden papier" (silk paper). By this means a most beautiful and pleasant light is obtained, which has no effect upon the most sensitive plates, affords considerably more brightness than ruby light, and does not in any way irritate the nerves. Working by such a light will be at once found to be agreeable; the change from the darkness to a brighter light when leaving the dark chamber to be less abrupt; and any one, by a very simple means, can convince himself of the superiority of this simple and costless system. Schumann recommends the brown "Seiden papier" to any of the other commercial brown papers. Three layers will generally be found sufficient for the most sensitive plates, and with a little extra care even orthochromatic plates—sensitive to yellow and orange—can be developed free from veils. The chemical influence of this yellowish brown light upon the various orthochromatic plates has been treated by Schumann in one of his earlier publications on the subject. Concluding his praises of this light for the dark room, Srna says, "I have only to recommend everyone, be he amateur or professional, who values health and wishes to preserve it, to introduce this system into his dark chamber, when I feel convinced that its superiority and advantage over any other light will be as apparent to him as they have been to myself."

Death of Herr Quidde.—I greatly regret to announce the decease of Herr Carl Quidde, a gentleman well-known in photographic circles in Germany. Herr Quidde died in Berlin, where he had mainly resided since 1849, on the 15th December last, in the 57th year of his age. He was principally known to the public as the earnest, polite, and indefatigable secretary of the Berlin Society for the Advancement of Photography, whose sittings I have often had occasion to notice. In private life Herr Quidde had a somewhat extended celebrity as an amateur musician of no mean talents; and also as a poet—particularly a parodist—of considerable gifts. His parodies of two of Schiller's works, to which music has been set, are played in the highest social circles in Berlin. Quidde went through the campaign of the Franco-German war in 1870-1871 as a photographer, and his death came quite unexpectedly upon his bereaved friends. A new work of his—a parody— was to have been played for the first time on the day of his death. He had visited London several times, and his father had taken out many mechanical patents at our Patent Office.

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BEAUTY OF POSE, PROPORTION, AND FEATURE IN PORTRAITURE.

BY HUGH BREBNER.*

THE artist who illustrated "A Trip to Blunderland" showed me one day a piece of paper covered with attempts to fulfil the author's wish, and to illustrate the entry of some character—a herald, I think—as "a point of interrogation!" I have not seen the book, but, if the finished design is as clever as the sketches were, I will back that pose against that of a man standing at "'tention!" for beauty of line.

After the curve of the principal line has been determined—by means of the disposition of the arms, hands, &c.—it remains for the artist to decide whether he will keep his composition simple, or enrich it with a secondary line, subordinately repeating the first in some region further removed from the centre. If the design is to be enriched, then, "though to a principal group a second or third be added, and a second and third mass of light, care must be taken that these subordinate actions and lights, neither each in particular, nor all together, come into any degree of competition with the principal; they should merely make a part of that whole which would be imperfect without them." To suit my present purpose, I would read "leading lines" for "groups," and "contrasts" or "lines of position" for "lights." And, where such embellishment is undertaken, the utmost care must be observed that the minor details of the subordinate schemes do not clash with those of the first. The principal line of direction should originate not too far from the centre, sweep in a "fine" curve towards the margin of the enclosing form, and return to itself at some little distance from the point at which it commenced. The chief point of interest, as I have said before, may be situate anywhere in this line, which should never be allowed to get out of the picture, nor even to touch its margin at any point. In a full-length portrait the body and arms will form the thickest part of the line, and no secondary curve of direction must cross the first at right angles, even when comparatively subdued in emphasis of light and shade; and in this case also it must not be allowed to run parallel with the principal line. Minor lines of direction may cross and coquette with the leading line as much as they like, but in nowise must they interfere to prevent its asserting itself as the subject of the picture.

Thus we see how pose is determined by the first requirements of good composition. But, having roughly estimated the relative positions of our principal points of attraction with regard to our boundary lines, and decided as to their relative values of light and shade with regard to each other, there still remains for us finally to determine the position and aspect of the details, regulated so far by what we have already done, but which have to be modified more or less—but generally more—by the incapacities or imperfections of our subjects. This involves a partial re-arrangement of almost everything; and depending, as I have said, on the individuality of our models, cannot at any length be touched upon in this paper.

Study the human figure. Avoid overcrowding and false accentuation as much as flat surfaces and empty uninteresting spaces. Mark, above all, the exquisite unsymmetrical balance of the human form. See how one line of position alternates with two lines of direction, and *vice versa*. Note the excessive difficulty in ever getting two parts, which in nature are the same, to assert themselves with equal force at once. Look at the utter absence of sharp angles, of right angles, of straight lines, and of perfect circles in nature. Since the forehead surrounds the eyes, the cheeks, the nose, the jaw, the mouth, and so on, I infer that a comparatively clear expanse should be allowed near every point of interest. This expanse may indeed be without limit if the point of interest is to be looked upon as an isolated fact, together with the absence of angles between the subject and bounding lines which such a treatment implies, affords the explanation of the exceptional beauty of a picture whose ect is entirely within the the canvas, and also of a vignette h imperceptibly fades into nothing. On the other hand, expanse must be carefully limited where the subject is e considered as a compound one, as in the case of a historical ure containing many figures, or a portrait embracing a head two hands, where each point of interest forms a line of posi- having a very intimate relationship to the others, when too h consideration cannot be given to the lines of direction ch bind them to each other, and determine the beauty of the e which I have called the principal or leading line of the re picture. For this reason it is that we insist that the dress t be intermediate in tint between the brilliance of the high s of the face and the shadow of the background; or, as in case of a vignette, be intermediate in contrast as compared hat of the head, for it is by such treatment alone that we ensure a broad, swinging, leading line to the entire composi- . It is for this reason, too, that we do not allow any point ine of importance to impinge upon any bounding line, and eby to add a false quantity to the concrete design, nor per- of the exit of any leading line of direction at a right angle ny of the lines enclosing our subject, unless we cannot ibly help it, as is the case where we have a three-quarter th figure of a man standing. This it is that determines that ountain shall not be cut off either at its base or at its sum- , and which suggests that a figure is better cut off in the dle of the chest, thigh, or leg, than at the chin, waist, knee, toe. Lastly, it is this that forbids of an akimbo elbow to touch a bounding line, thereby to form a K, and will not w a pronounced line of direction to bolt out of the picture ctly at a corner, and thus to suggest a series of radiating s, V—, foreign and antagonistic to the design.

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* Continued from page 58.

he power justly to criticise a work of art, chiefly in its arder aspects, is, I think, as rare as it is important, else the rcity of truly beautiful compositions would be less. Generally aking, if a picture be not absolutely faulty, the absence of uty in the composition is entirely overlooked, and the eye ws itself to be cajoled by mere beauty of detail. A better gment insists, however, on first of all deriving pleasure from entire effect, as composed of a mass of flowing curves, com- ed of masses of light and shade, existing utterly independently their subject-matter. From this point of view, a very utiful picture may be formed representing nothing at all, and ch one man may imagine to be meant for one thing, and ther for something entirely different. Everything to which ave referred hitherto can only appear as perfectly beautiful as sible where this is considered.

Patent Intelligence.

Applications for Letters Patent.

5. **William North**, and **Kate Lloyd North**, 47, Lincoln's nn Fields, London, for "Improvements in or connected with hotographic cameras and the sensitive media for exposure herein."—29th January, 1887.

Specification Published during the Week.

580. **Alexander Melville Clark**, of the firm of A. M. and m. Clark, of 53, Chancery Lane, in the County of Middlesex, ellow of the Institute of Patent Agents (a communication o him from abroad by Cornelius Theodore Cain, of Fredrica treet, Owensborough, in the County of Daviess and State of entucky, United States of America, photographer), for "An mproved process of producing and transferring photographs." —Dated 23rd October, 1886.

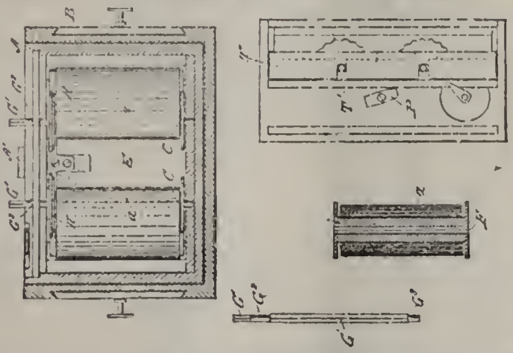
he Patentee thus describes his method :—

"This invention relates to the production of a superior quality photographs, and consists of a process whereby a picture film produced and transferred to a celluloid backing in such a nner that the film becomes incorporated with and forms t of said card or backing, the two parts—that is, the film the backing—becoming one integral piece.

"In carrying out the invention into practice, I preferably ploy a true plate glass of the desired size for the picture to be duced and transferred. The glass having been selected and perly cleaned, I form a safety-edge of albumen, one-eighth or one-quarter of an inch wide, on the outer edge of the plate, the object of the rim being to prevent the picture film from washing off during the manipulation of the plate, and the absence of albumen on the other part of the plate being to prevent the picture from adhering too tightly. The picture or transparency may be made by the collodio-chloride process, being printed, toned, and fixed as usual; or it may be made by the ordinary wet collodion process through a negative, in the manner well understood by photographers; but, if made by the latter process, the transparency should be flowed with a weak solution of bichloride of mercury, after being fixed in a weak cyanide potass solution, so that the shadows will be toned and blackened, which process of toning and blackening may be watched from the side of the plate opposite to that upon which the film is placed. After the film is properly toned, it is washed and placed to dry. When the film is dry, and ready to be transferred to the celluloid card, said card is flowed with a solution consisting of gum camphor and alcohol in the proportions of one ounce of gum camphor to one pint of alcohol. Although not absolutely essential, I prefer to flow the card with a five-grain solution of plain collodion—that is, five grains gun-cotton to one ounce solvent—which is allowed to set and dry previous to flowing with the camphor solution, as above stated. This camphor solution will dissolve the celluloid surface, and render it viscid or sticky. The flowed surface of the celluloid card is now applied to the picture film or transparency, being brought into close contact therewith, in order that all air-bubbles may be excluded. In the course of a few hours, or as soon as the parts are sufficiently dry, the celluloid card may be stripped from the plate, taking the picture film with it, which film will have a smooth surface, the same as that of the glass, and when the picture is so stripped from the glass it will be found that the softened celluloid surface will have permeated the picture film, and that the film and its backing will be in one integrate mass. The picture may now be trimmed to any desired size."

Patents Granted in America.

3 55,084. **David H. Houston**, Hunter, Dak., Photographic apparatus."—Filed August 29th, 1885. (No model).



Claim.—1. In a roll-holder, a removable bar of wood or other suitable material T, said bar having notches T′, which notches hold the top ends of the spool-shafts in place.

2. In a roll-holder, the combination, with the frame M,′ having a top and bottom plate connected by the partitions E, of the removable spool-shafts G, which spool-shafts have fixed on them, just above their bottom pivot ends, toothed wheels H, upon which a spring-pawl J, rests, and of hollow spools placed removably on said spool-shafts, the tops of which spool-shafts are held in place by the springs T^2, or any suitable latch.

3. In a roll-holder, the combination of the spool-shafts G, the removable bar of wood T, having notches in the same, said notches engaging the upper ends of the spool-shafts and holding said upper ends of the spool-shafts in place, and removable hollow spools on the spool-shaft.

4. In a roll-holder, the combination, with the frame M′, having a top and bottom plate connected by the partitions E, which frame fits to the light-tight box of the roll-holder of the removable shafts G, passed through removable hollow spools and removable toothed wheels on the spool-shafts, against which toothed wheels a spring-pawl J, rests, and of the roller D, having bearings in the frame M.

5. The combination, with a roll-holder, of a top plate having notches T′, spindles having their upper ends placed in the notches, springs or latches secured on the top plate for holding

the upper ends of the spindles in place, and spools on the spindles.

6. The combination, with a roll-holder, of a box A, the spindles G in the same, removable spools on the spindles, the back door O′, having a top flange O^2, provided with small holes O^3, and the latches P, for locking the door in place when shut.

7. In a roll-holder, the combination, with the box A, of the spindles G, carrying rolls of sensitized paper, the rollers D, of which one has a pointer R, and the hinged door O′, having a top flange O^2, provided with spindle holes O^3, through which key ends of the spindles pass.

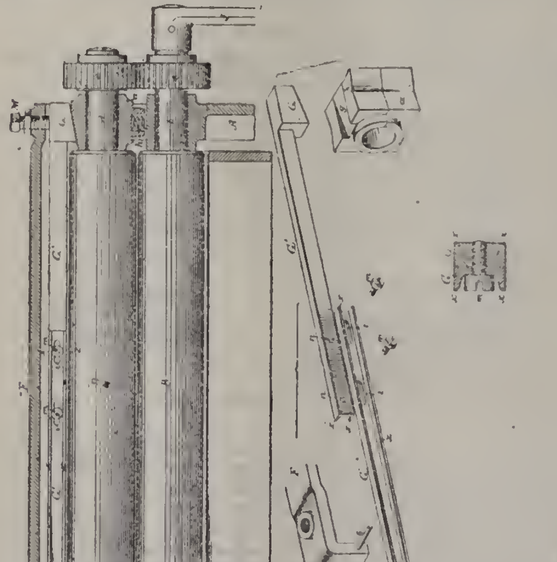
8. The combination, with the box A, having a top plate T, of the spindles G, having their upper ends held in notches in the top plate T, spools carrying sensitized paper or film mounted on the spindles, and a door hinged to the top of the box A, and having an opening R^3, through which the pointer on the roller D can show, and provided with apertures O^3, through which the upper ends of the spindles can pass.

9. The combination, with the box A, of the U-shaped brace W, secured on the upper surface of the bottom of the box, the partition E, secured to the upright parts of the braces, and the top plate T, secured on the tops of the braces.

10. In a roll-holder, the frame M′, composed of a top and bottom plate connected by a partition and U-shaped braces, which frame fits in the light-tight box of the roll-holder, and is removable therefrom.

11. In a roll-holder, the combination, with the frame M′, having a top and bottom plate connected by the partition E, of the removable spool-shafts G, passed through removable hollow spools, and removable toothed wheels H, upon which a spring-pawl J, rests.

355,923. **William G. Entrekin**, Philadelphia, Pa. "Photograph burnishing machine." Filed December 10, 1886. (No model.



Claim.—1. The combination of the frame and movable roll of a burnishing-machine, with wedges acting on the boxes of said movable roll, wedge-connecting bars having overlapping ends, and means for securing said overlapping ends of the bars together in different positions.

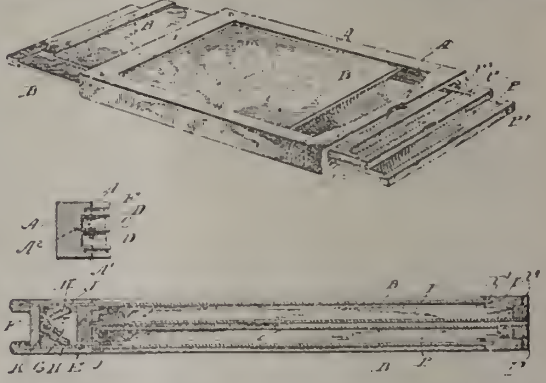
2. The combination of the fixed frame of the machine, the movable roll and its boxes, wedges acting on the latter and having inwardly-projecting ribbed bars with overlapping ends, and means for securing said overlapping ends together.

3. The combination of the fixed frame, the movable roll and its boxes, the opposite wedges, both facing in the same direction, a rigid connection between the two wedges, and a screw-stem longitudinally confined to the fixed frame and adapted to a threaded opening in one of said wedges.

4. The combination of the fixed frame of the machine, the movable roll and its boxes, the wedges acting on said boxes, and both facing in the same direction, a rigid transverse bar connecting said wedges and adjustable as to its length, and means for imparting longitudinal movement to one of the boxes, which movement is transmitted through the rigid connection to the other box.

5. The combination of the frame and movable roll of the machine, the wedges acting upon the boxes of said roll, and both facing in the same direction, a rigid connection between the wedges, an adjusting device effecting a simultaneous adjustment of both wedges, and a set-screw acting upon each wedge to adjust it independently of the other.

355,056. **Nelson S. Bowdish**, Skaneateles, N.Y. "Photographer's plate-holder."—Filed January 5, 1886. (No model.)

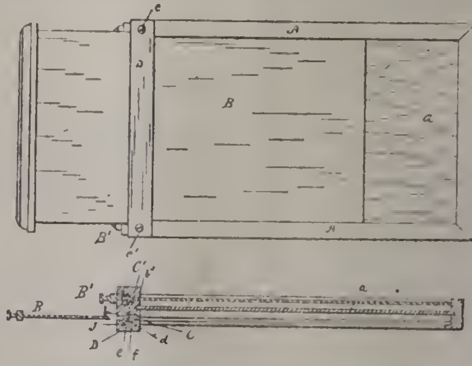


Claim.—1. The frame A, grooved as at A′, I′, and A^2, and cut away as at I^2, and having a strip C, inserted in the groove A^2, and provided with the cross-bar E, in combination with the slide B and plate-holders P.

2. A shutter for a photographer's plate-holder, comprising a transversely-scored strip and a textile backing.

3. The combination of the rod K, springs L, strip M, transversely-scored as at O, and the backing N.

356,072. **Edwin J. Leland**, Worcester, Mass., assignor of one-half to C. Henry Colvin, same place. "Photographic plate-holder."—Filed April 6, 1886. (No model.)

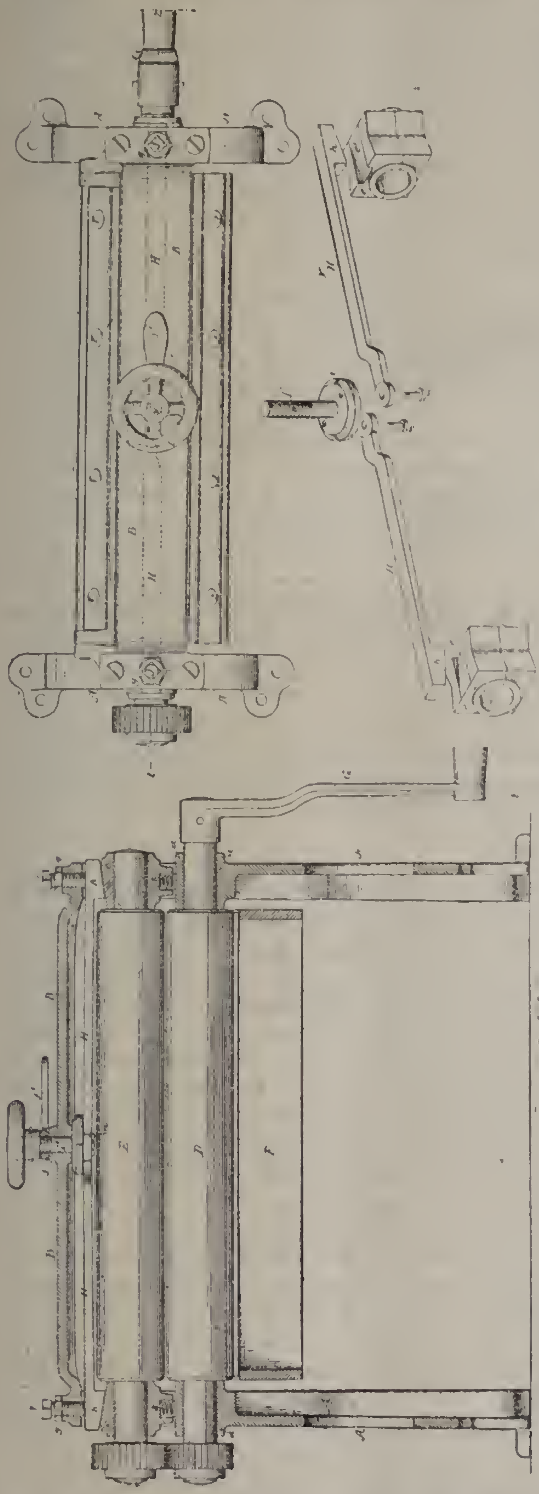


Claim.—1. The combination, in a photographic-plate holder provided with a slit or opening to receive a sliding shutter, of a lip formed in one of the walls of the slit, and an elastic strip attached to the opposite wall of the slit, said elastic strip standing at right angles with the walls of the slit, and resting against said slip.

2. The combination, with a photographic plate-holder having a slit to receive a slide covering the sensitive plate, of two elastic flexible diaphragms attached by one edge to opposite sides of the slit, so as to prevent the admission of light in a direct line.

355,922. **William G. Entrekin**, Philadelphia, Pa., "Photographic burnishing machine."—Filed October 15th, 1886. (No model).

Claim.—1. The combination of the fixed frame of a burnisher having a top cross-bar, the movable roll and its boxes, wedges acting on said boxes, rods connected to said wedges, and an adjusting device acting on said rods and occupying a position on the cross-bar between the opposite end frames of the machine.



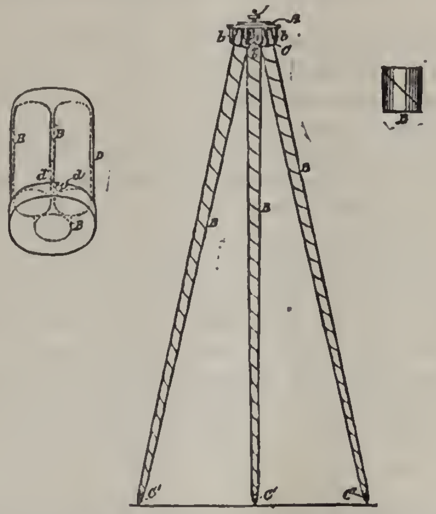
2. The combination of the movable roll of a burnisher and its boxes with wedges acting on said boxes, independent set-screws, serving as bearings for said wedges, and mechanism for imparting movement simultaneously to both wedges.]

3. The combination of the movable roll of a burnisher and its boxes with wedges acting on said boxes, rods carrying said wedges, and an operating-spindle having a disk with crank-pins, to which said rods are connected.

4. The combination of the movable roll of a burnisher and its boxes having bevelled grooves, the wedges adapted to said grooves, and means for simultaneously imparting a longitudinal movement to said wedges.

5. The combination of the movable roll of a burnisher and its boxes, wedges acting on said boxes, rods carrying said wedges, an operating spindle with disk connected to said rods, and a jam-nut on said spindle.

355,413. George H. Read, Brooklin, N. Y., "Camera stand." —Filed November 23rd, 1886. (No model.)



Claim. – 1. A camera-stand having legs severally composed of a strip of steel or other suitable metal spirally coiled, and so constituted that it will have a tendency to expand diametrically and extend in a direction transverse to the direction of its coils.

2. A camera-stand having legs severally composed of a strip of steel or like metal spirally coiled, and so constituted that it will have a tendency to expand diametrically and extend in a direction transverse to its coils and caps, combined with the strips.

3. A camera-stand having the following parts in combination, namely: a head for the support of a camera, caps pivotally connected to said head, strips of steel or like metal spirally coiled, and so constituted that they will have a tendency to expand diametrically and extend in a direction transverse to their coils, and adapted to be fitted into said caps.

Notes.

As an example of Collotype printed in the power-driven press—or machine as distinguished from a hand press—our Supplement of this week possesses interest.

The problem of the rapid and cheap multiplication of photographs is well solved by the collotype process, and, moreover, we have prints which will not fade; prints which, as regards permanency, stand on the same basis as ordinary engravings. In collotype, Germany takes the lead, and among German machine collotypers, Wagner and Co. hold a high position. As far as we know, attempts to produce collotype on the power-driven press have met with but scanty success in Great Britain.

The separate existence of the South London Society is now hanging in the balance, the question as to whether it shall be amalgamated with the Photographic Club having to be decided at a committee meeting which will have taken place (Thursday, Feb. 3rd) before our present issue is in the hands of the readers.

The presentation to the President of the Photographic Society took place as announced. Albert Toft's bust was deservedly admired. It is certainly a vigorous and faithful likeness of the President.

If what Mr. Espin, of the Liverpool Astronomical Society, says is true, English astronomical photographers ought to bestir themselves. In a letter to a contemporary, he points to the progress which the Americans have made of late years in stellar photography, and of the English he says: "At present we have only a few star-picture makers who seem incompetent to obtain any results except erroneous ones, while their pictures of nebulæ suggest that the author has sat in a pail of whiting, and then on a black piece of paper." This simile is very suggestive of the old story of the wag who made a mixture of sulphuric acid and whiting in a pudding basin, and, having photographed the turbid result after it had solidified, gravely showed the negative as a photograph of the moon! It is said that some of the *savants* were immensely puzzled at the change in the appearance of the familiar volcanoes.

In the current number of the *Century* appears an interesting article on stars by Professor Langley. The article also contains an admirable illustration of the nebulæ in Orion from Mr. Common's well-known negative. Professor Langley, in speaking of the advantages which photography has over drawings by the hand, refers to his own difficulties in tracing delineations of the nebulæ, and says that "the labours of weeks were literally only represented by what looked like a stain on the paper, and no two persons, however careful, could be sure that the change between the drawings of the nebulæ at different days was due to the alteration in the thing itself, or in the eye or hand of the observers."

It is awkward, when someone invites comments on productions which he thinks of exceptional excellence, to find that these comments are not altogether favourable. Something akin to this state of things was approached at the last meeting of the Royal Microscopical Society, when J. Mayall, Jun., at the direction of the President (Dr. Dallinger), drew attention to eleven photo-micrographs, sent by Dr. Van Heurck, which the latter thought showed results of exceptional merit. Mr. Mayall's opinion was scarcely so favourable, as in nearly every one of the eleven specimens he discovered some drawback. The most important defect pointed out was that in certain of the photographs the natural background had been painted out, whereas "if it was desired to give such photographs a real value, the background should not be interfered with, and a small tablet should be left, on which should be written, so as to print every impression, the particulars as to magnification, mounting, and other data for identifying the object which it was essential to be in possession of, in order to form any reliable opinion." There cannot be much doubt as to the wisdom of Mr. Mayall's suggestion. The painting-out of skies used to be objectionable enough, and rarely could it be done without interfering with the outline; much more so must this interference be in the case of the outline of a microscopical object.

Some time ago we announced a photographic exhibition to be held at Theale, near Reading, but we regret to find that the catalogue we have received shows it rather to be a shop than an exhibition.

A shop is a very useful institution in the present condition of society, but in a shop one does not look for or expect unbiassed information. This is a main reason why an exhibition should be kept free of the shop element.

Unless some item has escaped our notice, every article in the apparatus department is a stock article of commerce, and is on sale; still the price list is not nearly so complete and useful as the ordinary list of a dealer, many things being omitted, and others being unduly numerous.

Here are a few articles which could have been bought by anyone who cared to go to Theale and pay for admission to the show.

Squeegee, twelve-inch, 2s.; ditto, eight-inch, 1s. 6d.; Johnson's actinometer, 2s. 6d.; camera case (leather), £1 15s. 6d.; quarter-plate printing frame, 6½d.; half-plate ditto, 10½d.; half-plate lens, called "Optimus," £2 9s. 6d.

Then as to photographs. Her Majesty's dogs, by Cartland, were offered at 1s. 6d. each; but "The Finishing Touch," by John Moffatt, is £8, while John Pike offers a selection of six subjects at 15s. each. Lantern slides by Fincham are 1s. a-piece, but those by England Brothers are offered at 18s. to 20s. per dozen. The Rev. H. C. Wilder's photographs are not remarkably low in price, each item being priced at £1. On turning to the index we find that the Rev. H. C. Wilder is marked as an amateur, so there really may be some mistake about his pictures having been offered for sale, although they are distinctly priced in the catalogue.

Supposing the Rev. H. C. Wilder to be a clergyman of the Church of England, and he is really an amateur, some explanation is certainly due from the exhibition authorities; if, on the other hand, he has become a commercialist photographer, some explanation is due from him.

The family group is the *bete noir* of the photographer. What would he say to a group numbering one gentleman, three ladies, and twenty children, invading his studio, and worse, if such groups were a matter of everyday occurrence? This, however, appears to be the normal state of things in Utah, judging from the reproduction of a photograph which appeared in the Philadelphia press early last month. The photograph comprises the husband, his three wives, each holding a baby, and each with five children by her side. A fourth wife and three more children would have been in the picture, but, as the correspondent explains they had gone out shopping, the eldest girl and baby remaining behind to be photographed with the rest. One trembles to think of the criticism to which the proof must be subjected. It is often very difficult to please one mamma as to the portraits of her offspring; to please three or four must be absolutely impossible.

Persons ignorant of chemistry do not trouble themselves about slight differences in the nomenclature of chemical substances. The other day a friend held up to our notice a photograph of himself which an amateur had taken, and had, with the impatience of amateurs, forwarded fresh from the printing-frame. The sitter knew that if something was not done the print would darken, so he "fixed" it, as he imagined, and mounted it on a piece of card. "I can't make it out," said he; "it seems to darken when I put it in the light, yet I dipped it into soda before I mounted it." "Do you mean hyposulphite of soda?" we enquired. "I really don't know. It was common washing soda. Isn't it the same?"

A valuable paper on the application of isochromatic plates to photo-micrography, by M. Fancotte, appears in the Transactions of the Belgian Microscopical Society. M. Fancotte points out that while botanists have found no difficulty in obtaining photo-micrographs of diatoms, the histologist has not been so fortunate. The reason is that diatoms, being but feebly coloured, are rendered with tolerable fullness of detail by an ordinary sensitive plate; but in histology, the greater part of the objects to be studied are coloured with carmine, and to this tint the usual bromo-iodide plate is insensible. "But," observes M. Fancotte, "this great difficulty is now overcome. Gelatino-bromide plates can now be rendered sensible to the red rays, since the eosine plates of Attout-Taillefer permit of satisfactory negatives being obtained of sections, whether coloured in red or in any other tint."

Every week adds to the new uses to which photography is being put. It is now employed, we notice, by at least one enterprising London bookseller to assist in the advertising of new books. His plan is to display in a prominent place a framed announcement of a just published volume, and, in association with it, to exhibit a large photograph of the author. Thus the advertisement of the Laureate's new volume of poems is headed by a capital cabinet portrait of Lord Tennyson; whilst interest in Mr. Browning's coming book is stimulated by an excellent photographic presentment of the author of "The Ring and the Hook."

Nor is there any reason why this plan of photographically-illustrated advertising should not be further developed. Ambitious, but unknown, authors will certainly eagerly seize such an excuse for presenting their portrait to the public; whilst, in the case of anonymous works which achieve popularity, the display of the likeness of thei mysterious writers cannot fail to increase the public curiosity. Nor need the portraits only be given. For example, when Lord Tennyson next publishes a volume, the advertisement frame might contain, not only the photograph of the author in the throes of composition, but one also of the very table on which the poems were written, with realistic reproductions of the quill pen used for the purpose of writing them, and of the first sheet of corrected proof from the printers! That the public in these days would greatly appreciate such details cannot be for a moment doubted.

Review.

The American Annual of Photography and Photographic Times Almanac for 1887. Edited by C. W. Canfield. Price 2/-. (*New York: Scovill Manufacturing Company.*)

A heavy and large-typed volume in a fantastically be-bronzed paper cover; the notable heaviness being to great extent due to the fact that the paper is much too large for the printed matter.

If jumbles of words which will not scan may be called verse, we have verse in the new "American Annual of Photography," and the verses are arranged in three groups, and so constructed that the initial letters, when read downwards, build up the words *Photographic Times Annual*. Readers of the Photographic News will appreciate our consideration in placing before them only the shortest group of the three—that group of which the initial letters make the word *Times:*—

> 'Tis indeed placed here before me,
> In the very nick of time!
> Much, my "Annual," I adore thee,
> Ever after thou'lt be mine!
> Safe I am while thee possessing!

In order to further show the despicable kind of drivel which the Editor of this Almanac considers good enough for his readers, we quote from page 78; stuff not even up to the standard of the lowest grade of that kind of nonsense that is occasionally entertaining.

"*On the Lens.*—A lens is very important. In fact, you can't take a landscape without it.

"'Distance lens enchantment to the view.'

"I prefer a glass lens. Wooden lenses are cheaper, but I never could make them work. The fault was mine, perhaps; I am merely stating my experience.

"No good photographer ever lends his lens.

"If your lens gives too much light, put a 'stop' to it."

There is some moderately-sensible matter contributed by English writers to the American annual; but they seem, as a general thing, to have palmed off upon brother Jonathan such articles as no English photographic serial would be likely to consider quite up to the publication standard. We are glad to be able to say that no one of these writes down to anything near the level of the matter quoted above.

Still, we will do Mr. Canfield's production justice. We find a few really good things in it, but these are principally taken without acknowledgment from former issues of the English annuals.

What matter there is can be read with remarkable ease, not so much on account of the largeness of the type, but because the impression is well made from unworn type, and in a sufficiently-black ink; indeed, looking through the book, we do not find one place where the black impression becomes widened into illegibility, or degenerates into grey—a matter of very considerable importance in the case of a photographic book, which one may wish to refer to in the obscure light of the developing room.

THE PROGRESS OF ASTRONOMICAL PHOTOGRAPHY.

BY A. BROTHERS.*

In December, 1865, I read a long paper before the Photographic Section of the Literary and Philosophical Society on this subject. Since 1865 a good deal has been done in America, where there are many observatories where photography is practised. Amongst others, Mr. Whipple photographed stars, and the experiment was tried on the star *α* Lyræ. At that time only the brightest stars could be photographed, as only the Daguerreotype and collodion processes were available. In 1867 Mr. Bond photographed the double star Z. U. Majoris, the time occupied being eight seconds. Mr. Rutherford, another very eminent astronomer in America, turned his attention to photographing stars as well as the moon with his telescope of thirteen-inch aperture corrected for the chemical rays. His plan was to make a photograph, then allow the telescope to remain still for a few seconds, and then take another picture. That is a good plan, and in the days of photography when spots were more prevalent than they are on gelatine plates it was absolutely necessary. This would be all very well in photographing a few stars, but would be useless at the present day. Having succeeded in photographing stars, the next subject which occupied the attention of astronomers, chiefly in America, was that of photographing the nebulæ. These, relatively to the bright stars, are very faint objects indeed in the telescope. To photograph them in those days with the most sensitive surface they could employ was almost an impossibility. Mr. Draper, in 1851, had succeeded in doing it. An astronomer went from America to Cordova for the purpose of mapping the stars in the southern hemisphere, and after doing that turned his attention to photographing them, and succeeded to a great extent. In England, the Rev. Mr. Espin, some time resident near Liverpool, gave this subject his attention. His main object was to form a means of estimating the brightness of the stars, and in this he was partially successful.

Next we have Dr. Huggins, who has done much in the application of photography to astronomical purposes. He has done more in photographing the spectra than anyone else. He also had an idea that it would be possible to photograph the corona without an eclipse. Every photographer knows that it is difficult to photograph a dull object in the presence of a bright one. By using coloured blue media—liquid, I believe—he cut off the blue rays, and made a photograph which presented markings believed by some to be the corona. He was instrumental in sending Mr. Ray Woods to the Righi, in Switzerland, to pursue these experiments at a great elevation. He was there at the time we were having those curious pink sunsets. Those who were in the habit of observing such matters could see that peculiar glow, under favourable conditions, in the brightest sunlight. This gentleman's work in Switzerland was interfered with by the peculiar state of the atmosphere, but it was supposed his results corroborated those of Dr. Huggins. Another idea occurred to Dr. Huggins. He supposed that if during a total eclipse of the sun his results agreed, he should be able to show that the moon cuts off the rays of the corona when it comes up to the edge of the sun. The experiment was made during the last eclipse, and the results were not confirmatory of Dr. Higgins's ideas. I do not mean to say Dr. Huggins was not right, but at present the question is not settled. Pickering turned his attention to the subject of photographing the stars, and got four hundred and sixty-two stars on a plate 10 by 8, where fifty-eight only were shown on the chart by Dr. Gould, who showed stars of the ninth magnitude. To measure and plot fifty-eight stars is a work of very considerable labour, but it is only the labour of an hour or two if we use photography, so that the saving of time is enormous. In 1860 Dr. De la Rue went to Spain and succeeded in photographing a total eclipse of the sun, and proved the point as to the red prominences belonging to the sun. These red prominences are exceedingly brilliant masses of light which appear at certain places round the edge of the moon, very beautiful and generally of a rosy tint. They were a great mystery; nobody could tell what they were, and they could never be seen excepting during an eclipse, and the thing to prove was whether they really belonged to the sun. On photographs taken at the beginning of the eclipse the red prominences were seen on one side, and at the end of the eclipse on the other side. As the moon progressed across the sun's disc the red prominences were covered up, thus demonstrating that they belonged to the sun. This proof is not needed now: the spectroscope reveals those objects without the assistance of an eclipse.

About 1870 there was much speculation among astronomers as to the nature of the corona; some said it could only be an effect in our own atmosphere produced by the light striking the edge of the moon, and had nothing to do with the sun. As photography settled the matter of the red prominences, it was naturally supposed that it might settle this. The Royal Astronomical Society, aided by the Royal Society and the Government, resolved to test the matter, and I had the pleasure of helping. I knew that all previous attempts to photograph eclipses had been made by the telescope, and how very difficult it was to take pictures with a telescope the lenses in which were not corrected for the chemical rays. It occurred to me that the most sensible way was to photograph the eclipse as you would a landscape. I made inquiry to get the largest aperture lens I could; Mr. Dallmeyer had the only available instrument, and kindly lent it me, and with it I made some photographs. It was very lucky the whole thing was not a failure, as the clouds only just cleared away in time, leaving me only thirteen seconds of clear sky before the eclipse ended. The photograph taken at this time, when compared with others taken one thousand five hundred miles away, settled the point as to the corona being an appendage of the sun. The method I adopted in this instance has been used ever since in photographing eclipses of the sun.

I now come to speak of the work done in France by M. Janssen at Meudon, and Messrs. P. and Prosper Henry at the Paris Observatory. I may also say there are gentlemen at work in England pursuing the same line of work, and though I cannot show you very much of what they have done in stellar work, I can show some very beautiful photographs by Mr. Common. M. Janssen has given more attention to photographing the sun. I have here a photograph of the sun's surface, showing a very large spot visible to the naked eye in 1885. In this place, about twenty-five years ago, Mr. Nasmyth communicated a paper on the subject of the sun's surface, to which very little attention had been given before. Sir John Herschel and others had observed that the sun was not a smooth surface, but was broken up. Nasmyth said the surface appeared to be covered with objects like willow leaves. This called the attention of astronomers to the matter, especially the Rev. W. R. Dawes, who compared the appearance to a thatch of straw. Mr. Langley made a very beautiful drawing of a sunspot. Dr. Huggins made one totally different. But although they were all dissimilar, I think all the observers mean the same thing, because one which is enlarged from the one I have passed round is so exactly like Dr. Huggins' drawing that one might almost say the same hand had drawn it, though one is a photograph and the other a drawing. It may be called the mosaic pattern.

M. Janssen, in pursuing this subject, came to the conclusion that photography could do more than it had hitherto done. I will translate a few words from a paper he has sent me. M. Janssen says, "In a note presented to the Academy of France in December, 1877 . . . . . I said that photography offered not only, as is believed generally, the means of fixing luminous images, but that it constitutes a method of discovery in the sciences, and especially in astronomy. I added that the sensitive photographic plate, by reason of its admirable property of giving fixed images and rays much more extended than those which affect our retina—in fact, permitting the accumulation of radiations during a time more or less unlimited—and this sensitive film, I said, ought to be considered as the true retina of the scientist." Since the time this remarkable passage was written the Messrs. Henry have been busy photographing the stars. I will send round three photographs of parts of the constellation Cygnus, which contain stars down to the sixteenth magnitude, and to produce the negatives the exposure was from one hour and a quarter to three hours. You will notice that the stars at the corners are drawn out in the direction of the centre. That must be through a defect of the lens. I do not know that it diminishes the interest of these photographs, but if it should have the effect of lengthening the distances of the stars, a great part of the plate could not be utilised. It requires one of the largest and most perfect instruments to show stars of the sixteenth magnitude. A star is really only an optical point, and has no disc. No stars, not even Sirius, have discs, but you see these have. The length of exposure must be the cause of it, as the more you expose the more the rays spread. Mr. Common used a reflecting telescope of about three feet aperture and thirty-six feet focal length, and of course he was working under very different circumstances.

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* Abstract of a paper read before the Manchester Photographic Society.

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PHOTOGRAPHIC LENSES.

BY J. TRAILL TAYLOR.*

While there are few lenses which cannot, in some way or other, be made to conduce to the formation of a photographic image, yet does the photographic objective differ *per se* from all others in certain characteristics.

Arriving at a definition of what forms a photographic lens by contrasting it with the object-glass of a telescope, we find that whereas the function of the latter is to produce an image of objects which are transmiteed axially, or in near approximation to the axis, the former must not only do this, but more, for it has to take account of rays transmitted also at considerable obliquity to the axis, and, after such transmission, has to project these oblique rays to distances proportionately greater than axial ones ere they come to a focus, in order to supply the condition of a flat field. Hence the greater the obliquity of the pencils, the more elongated must be the converging beam, in order that this indispensable condition be fulfilled.

Again, whereas in visual lenses (by which term I here designate such as are employed in the formation of a merely visual image, as the telescope) it suffices to bring to a focus as many of the luminous or visual rays as possible, or as the irrationality of the spectrum and the glass at command will permit, the photographic lens has to take cognisance, not only of these, but of those which, possessing inferior luminousness, have more energetic action. In the correction of a photographic objective for achromatism, it is therefore desirable that the yellow and violet rays be united, in order that when a sharp image is seen at the focus on the camera screen, an equally sharp image will be produced on a sensitive plate placed on the same plane, technically known as working to focus, or having the visual and chemical foci coincident. To effect this in an astronomical telescope intended for photography, it is necessary that either the flint and crown elements of the objective shall be separated to some considerable extent, by which the definition, both visually and photographically, becomes lowered, or to have a supplementary crown glass so adjusted as to secure this condition of coincidence.

It not unfrequently happens that in a photographic lens corrected perfectly to work to focus in the centre of the field, the photographic definition towards the margin will be found to be of a higher class than the visual image. From this we may deduce the fact that a formula by which direct or axial rays are achromatised, does not include the case of oblique rays otherwise than as an approximation.

At this stage it may be well to say that I am to speak of lenses which are formed of optical glass as we find it in commerce at the present time, and shall avoid the realms of conjecture as to the possibilities which may arise from the practical introduction of new kinds of glass which at present are still in the tentative or rudimentary stage. This topic belongs as yet to the optics of the future.

When photography wss young, various devices to work with a large aperture, and at the same time to secure sharp definition, were had recourse to. It had been early found that single lenses would not answer, because of their actinic plane of representation being situated somewhat nearer to the lens than that of the visual focus; accordingly the single lens of the camera-obscura was supplanted by the achromatic lens of the telescope, the surface of maximum convexity being placed to the outside. Owing to the circumscribed area of definition, the lens was afterwards reversed as regards position, and a diaphragm placed in front. The value of Wollaston's meniscus lens was in time duly recognised as a means of securing an extended field; and a lens which I find engraved in a manual by Daguerre, published in 1839, is practically that which is being manufactured in the present year, 1887, subject in some cases to modifications, in others to none. At this juncture, and in the same year, Chevalier, a Paris optician, improved the illumination by combining two achromatic lenses.

But it was reserved for the genius of Professor Petzval, of Vienna, to make the grand discovery of the portrait lens. A year after Daguerre's discovery, the late Voigtländer, when calling upon Professor von Ettingshausen, was asked by that gentleman whether he could determine the refracting and dispersing power of different descriptions of crown and flint glass, because Professor Petzval, who was at that time filling the mathematical chair in the University of Vienna, had made the calculation of a photographic lens which could not be executed, in consequence of the qualities of the glass to be employed not being then in existence. Voigtländer, intimating his ability to do this, was asked to call immediately on Petzval, and was given a letter of introduction to that gentleman, accompanied by the observation that by furnishing the means to execute this lens he would render great service to the world, and secure for himself a high reputation. The result of the interview that ensued was that Voigtländer furnished the desired information respecting the qualities of the various glasses, which formed the foundation of the calculation of two combinations of lenses executed by Voigtländer, one of these being the well-known portrait combination in use at the present time, the other the orthoscopic lens, which was not introduced to public notice till 1857. The portrait lens was issued about 1841. Of all lenses extant, it is the one possessing the greatest angular aperture, by which term is understood the diameter of the lens in relation to its focus. In former times, when processes were less rapid than they now are, it is easy to conceive of the impetus given to portrait photography by the discovery of Petzval.

If a plano-convex lens, or one nearly of this form, be inserted in a camera and directed to the light, it will be observed that if the convex side be turned towards the view, an image more or less sharp will be formed at the focus, but that the area of sharpness will be exceedingly limited. By reversing the position of the lens, turning the flatter side out, the opposite result is obtained—there is no sharpness anywhere, but a generally better and more uniform image all over the focussing screen. This arises from spherical aberration, the margin of the lens when thus placed bringing the rays to a focus anterior to that effected by the central portions.

The condition for reducing this confused definition to sharpness is that a diaphragm shall be inserted in front of the lens under such circumstances that the centre of the picture shall be formed only by the centre of the lens, no rays finding admission to the margin of the lens but those which come from the side of the view to be delineated, and thus fall upon the surface in a more or less oblique manner. This diaphragm is therefore absolutely necessary with a lens of the nature described, in order to secure flatness of field, with good marginal as well as central definition. It is, therefore, necessary that the diaphragm be situated a little distance in front of the lens, because it is only when thus placed that rays are allowed access to the lens, subject to the conditions mentioned, those which would mar the sharpness being thus excluded. It must not, however, be imagined that the same effect would be produced by reducing the diameter to the size of the aperture in the diaphragm, for in such a case, while the centre would be sharp as before, the sides would be badly defined.

What has been said of the plano-convex lens is also true of the meniscus. This latter lends itself, by its form, so well to the transmission of rays possessing a great degree of obliquity to the axis, that all lenses which are intended to embrace a wide angle of subject must be of this form; but the spherical aberration being greater in a deep meniscus than in a flat lens, a stop somewhat smaller is requisite, in order to its reduction. The deep meniscus possesses properties of a well-marked difference from all others. Those who desire to see the finest exemplification of the so-called "depth of focus" possible to be obtained, have only to procure a meniscus of very deep form, expose its concave side to a bright object, such as a lamp flame, and observe the image. Having got it as sharp as possible, observe to what a great extent the lens may be moved backwards and forwards without the identity of the lamp flame ceasing to be noticed. It is true that it is surrounded by an aura of false light, caused by excessive spherical aberration, but the form of the flame itself is still there. In a deep meniscus the diaphragm must be small, and be placed comparatively close to the lens. This permits of the transmission of a very oblique ray, the incidence of the ray being more normal than in the case of a flatter lens; hence the reason why all wide-angle lenses, whether single or in combination, must partake of the external form of the deep meniscus, and the diaphragm be placed near to the lens.

Aplanatism is a somewhat ideal term, and cannot with strict accuracy be applied to photographic lenses. It was originally employed in 1791 by a Scotch *savant*, Dr. Blair, to denote lenses free from spherical aberration, in like manner as achromatism signifies freedom from chromatic aberration. Popularly it is held to designate an objective which gives sharp central defining with its full aperture, no diaphragm being employed. But this even an imperfectly corrected lens will do, provided its diameter be sufficiently reduced. We can, therefore, only talk in this connection by degrees of aplanatism, which would be the better understood if we had a zero from which to start the scale. This zero might be made to equal *f*, or a diameter equalling the focus; but at any rate, the term as it at present exists has not a sufficiently definite meaning. With this by way of protest against the mythical expression, I observe that of all photographic lenses extant, the old portrait combination is that in which the property of aplanatism, or maximum angular aperture, is greatest. As is the relation of aperture to focus, so is the intensity of the illumination. While a large angular aperture conduces to rapidity, in the same degree is it adverse to penetration, or the property of presenting on a plane surface, and with a degree of definition which satisfies the requirements of the artist, objects situated at various distances. This property of penetration, or depth of defining—unthinkingly called "depth of focus"—is a power of great value to the photographer, and is induced by means hereinafter described.

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* A paper read before the Society of Arts.

The optical and focal centre.—It is in many instances desirable that one should be able to know where the optical centre of a lens is situated. It is a property of this centre that any ray refracted by the lens which passes through it, emerges in a direction parallel to its incidence. It is from a point near to although not quite at the optical centre of a lens, or combination of lenses, that the focus must be measured. To find this centre, draw two parallel radial lines, one from the centre of each curvature, and both being oblique to the axis: then connect the points at which they touch the curved surface by a line, which, in the case of a meniscus, must be prolonged till it meet the axis. The point at which this junction-line touches the axis is the optical centre. In class books on optics the following rule is given: "Multiply the thickness of the lens by the radius of one surface, and divide the product by the sum of the radii, and the quotient is the distance of the centre from the vertex of that surface."

In a *combination* of lenses there is no fixed point which can be termed the optical centre. The mistake is frequently made of assigning it to a position near the diaphragm which has not necessarily any relation to that of the centre, which can only have its position determined upon knowing the precise circumstances under which the combination is to be used, for it has strict relation to the conjugate foci. What is commonly termed the optical centre in a combination is in reality the centre of conjugate foci, and this is determined by the conjugates, which may change with nearly every change of picture taken.

The *equivalent focus* of a lens is so termed from an image formed by it equalling in dimensions that made by a single lens. It has no relation to the misleading term "back-focus," so frequently employed. It is not difficult to conceive of an objective, the back-focus of which—that is, the distance between the posterior surface and the ground glass of the camera—may be four inches, while the real or equivalent focus is eight inches. As it is of great importance that photographers know precisely the foci of their lenses, I shall describe methods by which this may be ascertained. Let me first of all observe that, although it has been taught by some that the focus must be measured from the optical centre, this is not quite correct. In every lens or combination there are two nodal points, which are centres of admission and emission. They are sometimes designated the Gauss points, from the fact of Gauss having communicated an investigation of their properties to the Royal Society of Göttingen, in 1810. In the case of a simple bi-convex lens these points are situated between the optical centre and the surface, while in a meniscus lens it is outside of the lens, and a little within the optical centre. It is the back nodal point which concerns us at present, as that is the one from which the focus is measured. In a rectilinear combination this posterior focal centre is situated between the diaphragm and the back lens. Opticians interested in this are referred to Secretan's treatise on the true point from which the focus should be measured, or to Gauss's memoir.

It has often been recommended to determine the true focus of a lens of this nature by focussing the camera upon an object, so that the image and the object shall be of precisely the same size, and divide the distance apart of the two by four, the quotient expressing the true equivalent focus of the lens. This is altogether misleading as applied to the combination lens in common use, the focus thus obtained being greater than the true focus by nearly one-fourth of the distance at which the lenses are separated in the mount.

Out of several methods by which the equivalent focus may be ascertained, I shall mention only a few. Select a very thin spectacle glass which, after trial, is found to give an image on the focussing-screen of the same dimensions as that given by the photographic objective; and the distance of that glass from the focussing-screen, less one-fourth its thickness, is the focus. Or, having marked upon the ground-glass the precise spots upon which two well-defined objects depict their images near the margin on opposite sides of the screen, unscrew the lenses from the mount, and insert a pinhole diaphragm made in a thin metal plate. Rack the camera in or out until the images made by the pinhole correspond with that of the lens in dimensions. As before, the distance between the ground-glass and diaphragm is the focus.

The way which I prefer is Grubb's, on account of the ease with which it may be carried into operation and the accuracy of the result. On the ground-glass of the camera make two pencil marks at either end, each being a distance of an inch or so from the margin, although this is not material provided both are alike as regards distance. Having brought up a table to the window, spread upon it a sheet of paper, and upon this place the camera. Focus upon a distant scene, and rotate the camera until a well-marked object in the scene—such as a chimney or spire—is superposed on one of the lines drawn on the ground-glass. Now using the side of the camera as a ruler, draw a pencil line upon the sheet of paper upon which the camera is placed, and rotate the camera so as to superpose the same object upon the other mark on the ground glass, and again draw a line upon the paper. Having removed the camera, for which there is no more use, continue by aid of a flat rule these two angular lines until they met at a point, then connect them by a line as in the capital letter A, which line must equal in length the distance between the two marks made on the ground-glass, and with a foot-rule measure the junction of the angular lines to the centre of the cross line, and you have the true focus of the lens.

Shrocder's method is also simple and excellent, although it implies the possession of a camera capable of extending to about twice the focus of the lens. Extend the camera until the dimensions of the image on the ground-glass and of the object in front are alike. Having marked the position of the camera-back in relation to its baseboard, slide or rack it in until a distant object is in focus, and again mark the position of the back. The distance between the two positions, or that through which the camera-back was made to travel from the first focussing to the second, gives the equivalent focus of the lens. In a rectilinear symmetrical doublet of wide-angular aperture which I possess, having an equivalent focus of 13¼ inches, a reputed focus of 13 inches, and a back focus of 10¾ inches, I find that the focal or posterior nodal point is situated 3 inches back of the mechanical centre of the lens. This is a matter that greatly concerns those who have to make copies to scale, and who have the sides of their cameras graduated in order to facilitate accuracy and speed.

I shall now show, projected on the screen, a considerable variety of photographic objectives, and make a few observations on each in turn. First of all, I remark there are two ways by which a plano-convex or a meniscus lens can be achromatised. A bi-convex crown may be wedded to a plano-concave flint, or a concavo-convex flint to a plano-convex crown. If the meniscus is to be very deep in its external form, its components may be plano-convex crown, cemented to a plano-concave flint, although opticians generally prefer that the contact surfaces be curved, on account of the greater command it gives them for the correction.

The earliest form of objective was the plano-convex, or slightly curved meniscus. For reasons already given, it has a diaphragm, or stop, in front. In order that it should work with a larger aperture, the late Grubb reversed the relative positions of flint and crown, by which he was enabled to bring the diaphragm rather closer to the lens. Still later, the late Dallmeyer modified it by placing the flint between two crowns, for which further advantages were claimed. By recent improvements in the selection of glass, and curvature, this old objective (which in all its various forms is still much employed) is now made with such a large fixed diaphragm, as to render it capable of being employed in portraiture. This of course is owing to the minimising of the spherical aberration. Whilst admirable in other respects, it is unsuitable for copying or for architectural purposes, on account of its refracting the lateral rays in a greater proportion than the central ones. This distortion does not show near the middle of a picture, but becomes apparent when the included angle is moderately wide. From the nature of its construction it cannot supply the condition of orthographic projection, viz., that a ray shall emerge in a direction parallel to that at which it enters. To this end the ray would have to pass through the optical centre, which in such a lens cannot be done.

The Petzval portrait lens consists of a nearly plano-convex achromatised lens in front, with a double convex posterior lens at the other end of the tube. This latter is composed of a bi-convex crown and a concavo-convex of flint glass, the inner curves not being concentric, and the two are separated to a slight extent. This back combination fulfils a two-fold function: it shortens the focus, and thus intensifies the illumination, and as it possesses a large degree of negative spherical aberration, it counteracts the positive aberration of the front lens, and thus, with a large aperture, it brings rays to a sharp focus over a field quite large enough for single portraits. Some years ago Dallmeyer introduced a modification of the back lens, reversing the relative position of its element, as Grubb had done with the landscape lens, the requisite negative aberrations being obtained, as in the Petzval back, by the inner surfaces not being concentric. This form of back lens lends itself to the lowering of definition, when such is desired, as in the case of large faces in which the rugosities of the skin are not always desirable.

An American optician, Morrison, makes some of his portrait lenses—especially those for taking a large standing figure with full aperture—with an uncemented front lens and a Petzval back, the inner surfaces of the front lens having non-concentric lenses.

The most recently introduced lens of the portrait class owes its inception to Steinheil, and is constructed on lines quite different from all others. The front is a cemented positive combination, and consists of a convex crown and a concave flint The back combination is composed of a bi-concave flint and a bi-convex crown, these being separated to some considerable extent. Each combination exhibits chromatic and spherical aberration to a large extent, but in an opposite sense, so that the two combinations correct each other.

He has also imported the same idea in the construction of a landscape lens possessing greater power, and in which the back crown element is of unusual thickness, and is cemented to the flint. It is claimed for this construction of objective that the marginal definition is of superior class, and that astigmatism has been eliminated. In the landscape form the lenses are set so closely together as barely to permit a diaphragm to be inserted between them. The name "antiplanat" is applied to them.

One or the other of the lenses above described is employed in everyday portraiture in the studio. It is that class by which the greatest angular aperture can be secured.

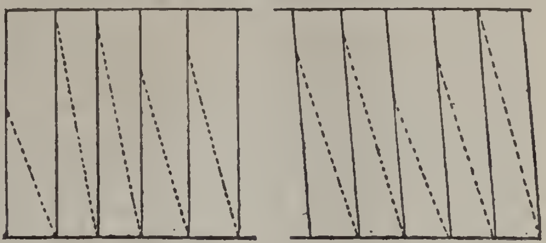
I have said that Petzval made the calculations of two objectives. The second, which lay in abeyance till 1857, was designated the orthoscopic lens, from a property claimed for it of giving rectilinear projection, but which subsequent investigation proved unfounded. Although it has been supplanted by others it is a useful lens, and gives good definition over a moderately large field with a large aperture. The front lens is the usual front achromatic of the portrait combination, with a smaller negative lens or dyalitic placed a short distance behind. This dyalitic lens is composed of a meniscus flint and a bi-convex crown. This lens is useful when one desires to take a larger image than the extension of his camera permits, as its focal centre is anterior to the front combination.

(*To be continued.*)

NOTE ON LIEUT.-COLONEL WATERHOUSE'S WASHING AND DRAINING RACK.

BY C. H. BOTHAMLEY.

In the News for January 7th (p. 10) there is a description by Lieut.-Colonel Waterhouse of a simple and convenient washing rack. It has the disadvantage, however, that the plates must be sloped with the films upwards, and they are consequently liable to collect dust during the process of drying. It may be useful to point out that a very slight alteration will remove this drawback. The divisions should be carried up to the top, and should either be vertical, or, better, be inclined at a smaller angle with the vertical than the plates. The latter can then be placed with the films downwards, as indicated in the sketch, in which the dotted lines represent plates.



Correspondence.

WHITE PAPER BEHIND THE PLATE.

Dear Sir,—One morning this week, while sitting at breakfast with the Year-Book under my nose, looking over the Jottings, page 140, the last three on that page caught my attention, especially as I had an engagement that morning to photograph one of the shops in a local factory. The photographs (neither of them good) were taken, one on a plate backed with white paper, as you suggest, and the other with an ordinary backing of non-actinic colour. The exposure of the black-backed one was about thirty seconds, the white-backed one about fifteen, and of the two the last-named is decidedly the better.—Yours truly, C. H. Evans.

THE PHOTOGRAPHIC CONFERENCE.

Dear Sir,—Will you allow me to make known through the News the following details in connection with the Photographic Conference organised for Tuesday next, the 8th of February, under the auspices of the Camera Club. The Conference will be held in the Hall of the Society of Arts, John Street, Adelphi, by permission of the Council, and the proceedings will pe opened at 11 a.m. by the President of the Club, Captain W. de W. Abney.

The communications to the meeting will be as follows, and in the following order:—

From 11 a.m. to 1 p.m.: 1. On Studies, W. Adcock; 2. Testing Sensitiveness of Plates, W. K. Burton; 3. Certain Features in Connection with Enlarging, J. Traill Taylor.

From 1 to 3 p.m. there will be an adjournment to inspect the exhibition of apparatus, and of members' pictures at the rooms of the Club.

The Conference will be resumed at 3, and continued till 5 p.m., for the reading of the following papers: 4. The Sulphuration of Platinotype Prints, H. H. O'Farrell; 5. Isochromatic Photography, W. H. Hyslop; 6. Subject not yet announced, Captain W. de W. Abney; 7. Rational Development, A. Pringle.

All interested in the subjects to be dealt with at the Conference are invited to attend by introduction of a member or by card. Formal tickets of invitation can be obtained on application to the undersigned.

In the evening, at 8 p.m., the first annual dinner for members and friends will be held at the Holborn Restaurant.

At the same hour on the previous evening Monday, 7th February, a special smoking concert will be given at the Club; and on the Thursday, 10th February, the evening meeting will be devoted to an explanation and discussion of the apparatus on show in the rooms.—I am, dear sir, yours faithfully, G. Davison, Hon. Sec.

21, *Bedford Row, W.C.*

Proceedings of Societies.

London and Provincial Photographic Association.

At the meeting held on the 27th ult., J. Trail Taylor in the chair, a discussion anent the relative value of commercial isochromatic *versus* ordinary bromide plates and a yellow screen for photographing colour surfaces took place.

Some examples were shown by A. L. Henderson which were favourable to the latter method, and the chairman referred to Bierstadt, of New York, having in 1878 claimed special advantages for the use of coloured transparent screens when chromatic objects had to be reproduced by photography. Attention having been drawn to an advertisement of a colouring process lately patented in this country,

The Chairman said the essential point about it was, that a carbon positive, uncoloured, was laid over another that had been coloured with aniline dyes, or other colouring matter. He believed the original process to have been patented by Ashton, of Birmingham, in 1864, and Woodbury prints were then employed. Since then nearly thirty patents had been taken out in connection with colouring photographs from the back, chrystoleum being one of them.

A brief discussion upon permanency and other virtues of the collodio-chloride process followed, and A. Cowan showed positives on opal by means of gelatine chloride. The exposure was three minutes in contact by diffused daylight; and, developed, the result showed that silver-chloride is capable of yielding opal positives of good colour when intelligently employed. It was, however, stated to be too slow to be available for camera exposure.

North London Photographic Society.

A meeting was held at Myddelton Hall, Islington, on Feb. 1, J. Traill Taylor in the chair.

A. Mackie showed an unexposed gelatine plate made by him early in 1876; he also showed a negative taken on a similar plate about the same date. The plate was, according to modern ideas, far too thinly coated, yet the negative was of ample density.

Then Mr. Healy showed results produced from a Wratten and Wainwright's gelatine plate made in 1878, but exposed and developed in 1886. The plate had deteriorated but slightly, an iridescent stain which extended to a depth of about half an inch from the margin being the only fault.

The President observed that it was well known that by various reagents the nature of the silver salt in a sensitive film could be changed. By treating a developed image with bichromate of potash and hydrochloric acid the deposited silver would be converted into chloride, and so in other directions. He inquired if any one present had made a systematic attempt to restore to something akin to their original quality plates which had become deteriorated by keeping.

F. W. Hart said that he had successfully treated negatives showing this defect by immersing them in chlorine water, thereby converting all the silver compounds in the negative to chloride of silver; after this treatment the plate was exposed to light, and then redeveloped with ferrous-oxalate developer. With regard to treating unexposed plates for this complaint, he thought the application of bromine water would probably prove a remedy, as the sulphur compounds of silver, to the formation of which this phenomenon was due, would be converted back into bromide of silver.

Mr. Mackie having passed round two negatives which showed bands of insensitiveness, due, he explained, to the plates having been kept for some time in the slides before use, and the material of which the hinges were formed having had some chemical action, several members related similar experiences, while others instanced cases in which plates had been kept in the slides for long periods without harm.

Mr. Hart spoke of a case where the hinges of the dark slide had caused the opposite result. In this case the developed negative showed a reduction of the silver.

Mr. Cox showed a negative in which one of the upper corners was thinner than the other portion. He could not account for this, as there was a clearly-marked boundary which ran in a diagonal direction. It was suggested that the plates had been packed with a sheet of paper between each pair, and that in this case the corner of the paper had become folded back.

The next meeting of the Society will be held on February 15th. The President will give an address on "The Lenses in Everyday Use." Visitors are invited.

Derby Photographic Society.

The annual conversazione of this Society, held in the St. James's Hall on January 26th, was a pleasant and successful gathering. The side walls of the building were covered with specimens of the photographer's art, obtained by different processes, while the centre of the room was occupied by other photographs, and various kinds of appliances. The subjects included portraits, and scenes in this and other countries. The collection was the largest ever exhibited under the auspices of the Society, and a large and influential company had accepted the invitation of the Committee to be present.

Captain Abney, who presided, opened the proceedings by delivering a brief but interesting address. He said that the reason why he wished to see so many people following the pursuit of photography was that an increase of numbers meant an increase in the power of observation, which was most desirable, for if they traced the history of this beautiful scientific art, they would find that its whole progress had arisen from the power of observation possessed by a few individuals. Photography was generally supposed to have had its rise in the reign of Queen Victoria, but he was afraid he could not agree with that dictum, for it really had its rise in 1801, with a discovery by Wedgwood. Having briefly traced the progress of the art since that time, and mentioned that the pursuit of it was now viewed more favourably than it was less than twenty years ago, when it was looked down upon, Captain Abney said he believed that in the human breast there was always a yearning either for science or art. If any one wished to become a scientific man he could not do so without knowing something about photography. It was not everybody who could draw and paint, but yet they might possess a true artistic feeling, and photography was the legitimate expression of a yearning for art—that yearning by which they expressed on a plate that which they failed to express by means of the fingers. Again, those who had not time to learn either drawing or painting should take to the camera, and thus express their artistic feeling by means of the plate. A great deal more was now known than formerly about the sun and moon, and the star depths which the photographic plate had shown to exist beyond what they could see. Photography was an unerring recorder of facts: it possessed no personal bias or error, and if they wanted to be correct they must photograph what they saw, and not trust to impressions. Captain Abney concluded his remarks by giving ten reasons why all present should become photographers. The first, and perhaps the most important reason, was that it would give them outdoor exercise, which, to persons leading a sedentary life, was very valuable. The second reason was that art trained the eye, and they could never thoroughly appreciate nature until they had received that training. Another reason was that it trained the hands, making them neat and skilful. It also taught patience, a most important principle. It also taught people to think, and he believed that any person who passed through life without it, was not fit to live. Photography also gave rise to a healthy and unselfish competition. The practice of photography was a sensible amusement; it was the first step to chemical and physical science.

After Captain Abney's address, a musical programme was gone through. Some admirable lantern slides were shown during the evening.

Liverpool Amateur Photographic Association.

The usual monthly meeting was held on the 27th ultimo, at the Royal Institution, Colquitt Street, the chair being occupied by the retiring President, P. H. Phillips, who introduced his successor for the current year, George H. Rutter.

The following were elected members:—William H Coward, W. Tomkinson, and W. Priestnall. Joseph Earp was elected treasurer for the current year.

Dr. Kenyon exhibited a negative on an Eastman "stripping film" mounted on glass. Originally the film was on paper, and was exposed with the roll of which it formed a part in the roller slide. Development was effected with ferrous oxalate in the usual way. After fixing and a brief wash, the film still on its paper support, so far treated as any other paper negative, was then simply removed from the washing water in contact with a clean piece of glass a little larger than itself, and was placed in a warm room and allowed to dry thoroughly. Dr. Kenyon placed the glass, with the paper and film now firmly adherent, in water about 100° temperature, and soon afterwards poured upon it water nearly boiling; in two or three minutes the paper was thoroughly loose, and was removed without the least difficulty. The plate, with the film still adherent, was then rinsed with the hot water. The negative then only required drying, in which condition it could be used for printing lantern slides and for enlargements, or, being a reversed negative, for printing by the carbon process. Used in this way the stripping films involve no extra labour worth speaking of as compared with glass negatives, whilst the convenience of paper in the field is fully taken advantage of. If the negative be left in the state as above described, there are inequalities in the free surface, which will be completely filled up, and a perfectly polished result obtained if the stripping process be completely carried out; this involves the superposition of a sheet of gelatine one side of which is matt and the other polished; consequently, when the film is detached from the glass, each side is polished, and the result is as perfect in every respect as if taken on a glass plate.

A. W. Beer then read his paper, entitled "A Holiday in the North Riding," which was illustrated by nearly one hundred slides, the lantern being efficiently operated by Mr. Phillips.

Birmingham Photographic Society.

The usual fortnightly meeting was held at the Technical Schools, Bridge Street, on the 27th ult., T. J. Delicate in the chair.

Mrs. Welford, Messrs. J. Claburu, C. Clinney, J. R. Curtis, C. Greenwood, W. S. Harding, J.P., R. W. Pumphrey, and J. S. Smithson, were elected members.

The Hon. Secretary (W. S. Pickard) announced he had received a communication from an anonymous member offering a prize of a standard work on photography for the best lantern slide exhibited at the next meeting, Feb. 18. Lantern exhibition to be the work of amateur only judging by the members of the lantern section committee.

J. Godfrey asked: How is it that I cannot get detail and density in my snow pictures either with long or short exposures?

J. W. Welford: The negative shown is under developed, and must have been exposed in a strong light. It is always advisable, in taking snow scenes, to get in as much shadow as possible.

B. Karleese, E. Middleton, and J. Nock gave their experiences with snow scenes, and mentioned the fact that the faces of figures taken in the snow coming out black on the prints arises from intense light diffusing itself on the plate and causing a kind of halation.

Vice-president J. W. Harrison then gave his paper on the "Sensitometer," prefacing his remarks by saying that it was very useful to the amateur as well as to the professional to be able to understand with accuracy the rapidity of any fresh make or batch of plates he may happen to come across, and of which he had no previous knowledge of the working. The first sensitometer was made by Deau, in 1856, and there are several of recent years, including one by Sponge, and by L. Warnerke; the latter is the sensitometer by which the bulk of the plate manufacturers advertise the standard rapidity of their plates.

In the discussion which followed, A. Pumphrey preferred keeping a standard box of plates which he knew, and before using a fresh batch exposing a standard plate and a new one at the same time, and developing in the same dish.

The Photographic Society of Philadelphia.

The annual meeting was held on January 5th, with President Frederic Graff in the chair.

On the announcement of his re-election as President, F. Graff delivered an address, from which the following is extracted:—

"Although no very startling discoveries have been published in the photographic world during the past year, the improvements in all branches of the work have been steady and important. The use of paper negatives and films is a new departure, and, with the ingenious apparatus for their ready employment, is very attractive to the amateurs, who as a rule prefer light weight. The prints, which may be made upon bromide paper by artificial light, supply a want, and is a great boon to most amateurs. A number of new lenses have appeared during the year, the efforts of the makers being to produce such as will carry large openings, with sharpness and depth of focus, that we may be enabled to better gratify the strong desire now prevalent for accomplishing instantaneous exposures. With the same object the use of the so-called detective camera has been greater than ever before, and with better results. The manufacturers of dry plates have kept pace with improved lenses and new rapid shutters, until it has become impossible to decide in what infinitesimal fraction of a second a picture may be obtained. The use of photographic processes for book and other illustrations is growing with very great rapidity, and so general that even our daily newspapers produce overnight in a few hours, we may almost say minutes, some sort of outline that often serves at least to make clearer the articles written descriptive of an accident or event. Relief blocks capable of being set up with letter-press are now a necessity. The applications of our favourite pursuit are so numerous that it would take too much time, and be of little profit, even to refer to a tithe of them, extending as they do to botany, meteorology, biology, geology, zoology; in fact, to the whole catalogue of "ologies." Its adaptation to the use of astronomy will be enriched in the near future by the use of the most stupendous camera ever conceived—namely, one having an object-glass thirty-six inches diameter, and a focus of more than fifty feet; I refer to the instrument at the Lick observatory, California, where a duplicate lens for the great telescope is about to be adapted to photographic purposes; the enormous size and perfection of the instrument, and the phenomenal clearness of the atmosphere at the locality of the observatory, must produce results not heretofore reached. The number of societies in the United States, with the same objects as our own, is now reported to be over thirty, and largely composed of enthusiastic amateurs."

The proposal of John Sartain, that members should take part in the American Exhibition in London, was taken up, and a committee appointed to take such measures as may be necessary in regard to the sending of exhibits by members of the Society.

The paper for the evening was read by Dr. Ellerslie Wallace, on "Silver Printing on Albumenized Paper."

During the discussion which followed, the Secretary stated that he had used Labarraque's solution for eliminating hypo from prints for the last two years—pictures which had been exposed in frames during that time showing no perceptible change, and the whole washing process being completed in from half an hour to an hour.

Dr. Wallace considered the action of the chlorine on the print to be injurious, and preferred, where it was necessary to economize time in washing, to run the prints repeatedly through a clothes-wringer into fresh changes of water. There was some danger of tearing the prints by this process; but the elimination of the hypo was very thorough.

Two questions in the box asked:

1st. Does a portrait lens contribute to roundness of image in portraiture?

As bearing on this subject, the Secretary read an extract from an article which argued that a portrait or other lens used with a large opening, tended to give an appearance of relief in the image, as well as of brightness, nature, and life.

2nd. The cause of halation in glass negatives is generally explained as being the result of the light passing through the lens, and then through the film, striking upon the back of the glass, then being reflected at a different angle upon the reverse side of the film. Photographic books state that this can be obviated by coating the back of the negative in any opaque colour. If this be so, why does not the septum, which is invariably black, and held closely to the plate, answer the same purpose. Will the members of this Society please state if, in their experience with paper negatives, they have found absolutely no halation?

Samuel Sartain stated that the opaque backing must be in optical contact, to prevent reflection, and this was not the case with the septum in its relation to the plate.

Talk in the Studio.

Photographic Society of Great Britain.—The annual meeting of this Society will take place on Tuesday next, February 8th, at 8 p.m., at the Gallery, 5a, Pall Mall East, when the report of the Council will be read, the financial statement made, and the election of officers take place, after which J. B.

Spurge will read a paper "On a method of estimating photographic deposits with reference to the printing quality of negatives."

THE PHOTOGRAPHIC CONFERENCE.—The first conference of photographers in London will be held in the Theatre of the Society of Arts, on Tuesday next, February 8th, and has been organised by the Camera Club (see page 77).

MALLIN'S PHOTOGRAPH OF SEA-GULLS.—C. T. Mallin requests us to say that this was taken with a lens called "Paragon Doublet," and made by Swift and Sons.

THE FIRST ANNUAL EXHIBITION of the combined work of the Photographic Society of Philadelphia, the Boston Camera Club, and the Society of Amateur Photographers of New York, will be held under the auspices of the Society of Amateur Photographers of New York, from March 26th to April 2nd, 1887, at the Ortgies' Gallery, 845, Broadway (near 14th Street), New York. *Committee of Arrangements.*—C. W. Canfield, F. C. Beach, John T. Granger, Robt. S. Redfield, George E. Cabot. *Conditions.*—The exhibitions shall be held in the cities of New York, Boston, and Philadelphia, in rotation. Three representatives from each of the three societies shall constitute a Joint Exhibition Council, having general charge of all matters connected with the Exhibitions, with power to alter or amend the rules. The representatives from each society shall be entitled to three votes on any question properly before the council. The immediate details of each exhibition shall be in charge of a committee numbering five, appointed by the Joint Exhibition Council, three of whom shall be members of the local society. Diplomas shall be awarded for artistic, scientific, and technical excellence by a Board of Judges; one diploma being reserved for the best set of six lantern slides, and one for the best work by ladies. The Board of Judges shall consist of five persons, chosen by the Joint Exhibition Council, with special reference to their combined knowledge of the scientific, technical, and artistic requirements of photography. The members of the Board of Judges shall not compete for awards, nor be connected in any way with the management of the exhibition. The decision of the Board of Judges shall be final. *Rules.*—1. No picture which has once been exhibited in competition at a joint exhibition shall be again admitted for competition. 2. No picture will be received "for exhibition only," unless by special consent of the Committee of Arrangements. 3. All pictures, except those from foreign exhibitors, must be framed (with or without glass, at the option of the exhibitor). Pictures from foreign exhibitors sent unmounted will be prepared for exhibition by the Committee of Arrangements. 4. The Committee of Arrangements shall have the right to reject the whole or portions of any exhibit offered. 5. Entries of all exhibits must be made on blanks issued by the Committee of Arrangements, and must be filed with the committee at least one week in advance of the date fixed for the exhibition, giving, so far as possible, information on the following points: Number and size of frames; amount of wall space required; total number of pictures; subject or title of each; lens and plate used for negative; if for sale; price; name, address, and society of exhibitor. 6. Each frame must have attached by the exhibitor a label, to be read from the front, stating subject, lens, plate, and exhibitor's name, of each print therein contained; blank labels will be furnished on application. 7. No picture will be received later than one week prior to date of opening of the exhibition, and no picture may be withdrawn before the close of the exhibition. 8. All pictures must be sent at owner's risk, prepaid, and delivered to the Committee of Arrangements at the place by them indicated, and return charges collected by carrier. 9. The committee will not be responsible for any loss or damage that may occur to exhibits while in its charge, but will use all reasonable care to prevent such occurrence; and at the close of the exhibition will repack each exhibit, and ship as directed by the exhibitor. 10. Advertising in any form in connection with an exhibit is strictly prohibited. 11. No pictures which have taken prizes elsewhere shall be so designated until after the awards have been announced. 12. A charge shall be made for wall-space at the rate of twenty-five cents per square foot (the minimum charge being one dollar) to all except members of the three societies and foreign exhibitors. The amount of charge for wall space must be enclosed with entry form to the Committee of Arrangements. If any of the pictures entered are not hung, a due proportion of the charges will be returned. A commission of 10 per cent. on all sales will be retained. 13. Arrangements shall be made for the proper exhibition of lantern slides on the screen. 14. The Committee of Arrangements, acting for the local society, shall receive all income and make all payments for expenses of the exhibition; the said committee being required to turn over to the local society, within a reasonable time after the close of the exhibition, properly authenticated vouchers for all expenditures, together with a statement of receipts, and the balance on hand, if any. All pictures must be sent, charges prepaid, to the Society of Amateur Photographers of New York, 122, West 36th Street, New York City, endorsed "For Annual Exhibition," and delivered before 9 p.m., Saturday evening, March 19th, 1887. Correspondence must be addressed to C. W. Canfield, Chairman, 122, West 36th Street, New York, U.S.A. Photographs from abroad may be sent unmounted.

PLATINOTYPE.—Readers are requested to cross through "work" in thirteenth line from top, second column, of page 51; and to write "iron" in its place.

PHOTOGRAPHIC CLUB.—The subject for discussion on Feb. 9th will be "The Artistic Treatment of Photographs." Norman Macbeth will demonstrate.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

HAROLD.—1. In the YEAR-BOOK for 1886, p. 178. 2. A solution of chloride of palladium or iridium, about thirty grains to a pint of water.

C. E. W.—1. Often it does appear to remain in the system for a long time without manifesting itself. 2. A breaking-out on the skin.

C. S. AND G.—It has been forwarded as you suggest.

E. W. S.—There is certainly a discrepancy, and, until the author explains, one can only conjecture.

H. McR.—1. As far as we know, there are no manufacturers of the article in the Colony, and you had better arrange to have it sent out to you. 2. Very good indeed; retouching would have spoiled it.

N. P.—Gum dammar dissolved in benzole. About sixty grains of the gum to each ounce of solvent is a convenient strength; but, for the purpose you refer to, rather more gum may be used.

W. C. PEARSON.—1. One main point is that it will give straight lines, and, when stopped down, it is adapted for landscape work; in fact, it is practically a universal lens. 2. We have not seen the studios referred to, and so cannot give an opinion.

A. T. E.—It shall be attended to.

W. WILSON.—We are by no means sure as to the best way to go to work; but we will endeavour to ascertain.

R. FOSTER.—Possibly you can get a copy at Spooner's in the Strand.

E. J. BOAKE.—Perhaps the most convenient method for making portraits upon opal glass is the carbon process. Particulars will be found in the Autotype Manual, published at 74, New Oxford Street.

Photographs Registered.

W. GARTHWAITE (Grimsby)—4 Photos, Views of Cleethorpe.

W. P. MARSH (Bognor)—2 Photos. of Children paddling in the Sea.

HAROLD BAKER (Birmingham)—Photo of Mr. Thorne as "Koko" in the "Mikado."

T. F. GEOGHEGAN (Dublin)—2 Photos. Archdeacon Cavanagh; 3 Photos of Exterior Views of Knock Church; 1 Photo. of Interior View of Knock Church.

J. N. McNIEL (Mill Street, Crewe)—1 Photo. of W. S. B. McLaren, M. P.; 1 Photo of Mr. and Mrs. McLaren.

The Photographic News.

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For Advertisement Scale see page v.

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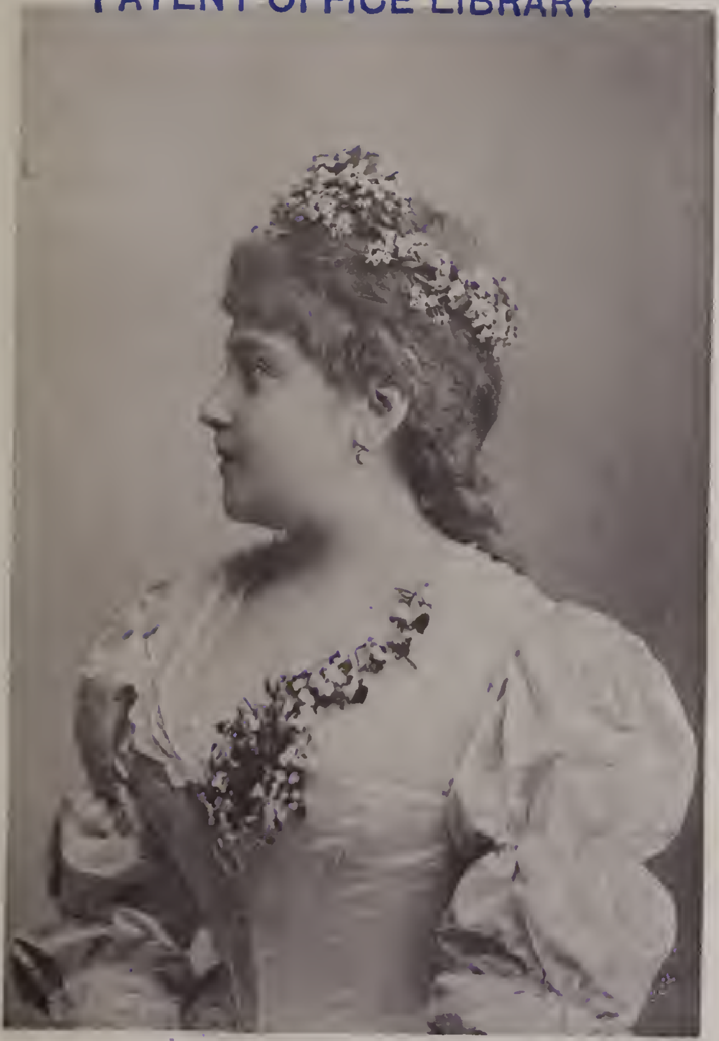

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THE PHOTOGRAPHIC NEWS.

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THE CONVENTION OF PHOTOGRAPHERS IN LONDON.

The organisers of the Convention which sat on Tuesday in the Hall of the Society of Arts have reason to be satisfied with the results of their endeavours, the attendance being good and representative.

On the previous evening the members of the Club appear to have fortified themselves for the business of the Tuesday by the holding of a smoking concert at the Club rooms, at which the greatest conviviality prevailed. The programme included songs by Valentine Blanchard, and a clever topical photographic ditty by H. H. O'Farrell, set to the air, " We've got 'em on the list."

The proceedings at the Conference were opened by a brief address from Captain Abney, the president, who then called upon W. Adcock to read a paper on " Studies." The reader pointed out the usefulness of a study giving the details and component parts of the figure, specially as a means towards beauty of drawing in photographic work. Some examples of Adcock's work in this direction, showing studies of hands clasped or upraised, and also other pictures, were exhibited to the meeting.

One of the principal features of the day was the persistent way in which Beach's developer kept cropping up. And those who failed to make good pictures so generally blamed this developer, that Captain Abney referred to it as the " Aunt Sally of the day."

The paper from Burton proved one of the most interesting of the day, a general opinion being expressed that thick filmed negatives were necessary to the securing of a wide angle of gradation. Abney and Burton were at issue as to the decadence of phosphorescent screens for illuminating purposes, Abney finding those kept embedded in paraffin as luminous now as when first obtained several years before; whilst Burton found his, cared for in the same manner, disintegrated, only spots of the plate showing in luminosity.

Traill Taylor gave a brief address explaining his use of the albo-carbon light for lantern purposes, in place of the paraffin of the lanterns with the Greek names and the nasty smells. He used two burners on the one albo-carbon chamber, the flames being one behind the other, and a point of light produced by the fixing of a diaphragm in front, to which diaphragm a small condensing lens was attached, in addition to the usual condensers, which could by use of this added lens be brought nearer the flame.

The subject of the incandescent gas light was brought up by Trueman Wood.

At one o'clock the Conference adjourned, and members and visitors took the opportunity of seeing the Club premises, the apparatus, and pictures on show there.

At three the Conference was renewed by a paper from H. H. O'Farrell; but Pringle on the " Sulphuration of Platinotype Prints " did not appear to interest the meeting and H. H. O'Farrell and Mr. Willis had the subject to themselves.

The two papers by W. H. Hyslop and Captain Abney respectively were taken together. W. H. Hyslop handed round prints showing results of many experiments in orthochromatizing, the best result, he considered, being obtained in the case treated with chloride of silver and erythrosin. He had found it possible to treat films in the same way as glass, and he handed round stripping films that had undergone the process for inspection.

Captain Abney projected on the screen a succession of diagrams and pictures illustrative of his address, in which he feared his remarks would be felt as a douche by some, for he came to the conclusion that though useful for copying pictures, and on occasions where yellow light could be used, orthochromatic plates would be of very little service to the landscape photographer, who was afflicted with sky and sun. Except for faint white clouds, and a blue sky, he thought they would be useless. Abney also exhibited a large hemispherical reflector, the inside reflecting surface being of a bright yellow colour. This he used instead of glass, and he exhibited results obtained by its use which were very striking.

Burton regretted to hear Captain Abney's deductions, and was at a loss to understand the examples shown by certain German scientists where two landscape pictures of same subject—one from ortho. plate, the other from ordinary plate—showed such marvellous differences, to the advantage of the orthochromatized plates.

A. L. Henderson believed that eosine was not required. By a combination of saffron and cochineal, and by using slow plates in treating, he obtained the same results. He showed coloured diagrams and orthochromatic prints from them, and protested he was quite disinterested, as not being in any way commercially engaged in the production of such plates.

Captain Abney pointed out that Henderson's diagrams were only blue and yellow.

In bringing the Conference to a conclusion, Captain Abney said the members might congratulate themselves on the great success of the gathering. He hoped they would all meet again in the same way next year, and that the papers would be even more valuable than those they had that day heard.

After the Club general meetings the members sat down to their first annual dinner given at the Holborn Restaurant. The company included many visitors, and numbered eighty.

We understand that the pictures and the apparatus on show at the Camera Club will remain there for some time—the apparatus for about a week, and the pictures for a month. Visitors desirous of inspecting the exhibition are, we believe, invited to do so.

CARBON PRINTING FOR AMATEURS.

The carbon process does not appear to receive that attention from amateurs which its great merits entitle it to. Probably the reason is that there exists amongst those who have never practised it an exaggerated notion of the difficulties that there are in working it. These difficulties are, to a considerable extent, imaginary, or very easily overcome. Indeed, we have no hesitation in saying that when the carbon process is worked at its simplest, the tissue being purchased ready sensitized, and the single transfer process being used, it is a remarkably easy and straightforward method of printing.

The difficulty of getting reliable tissue ready sensitized—that is to say, coated with pigmented gelatine containing bichromate—has been, until comparatively recent times, one of the drawbacks to the process. The trouble of sensitizing and drying the tissue is very considerable, and, moreover, the results to be obtained on tissue sensitized on a bichromate bath are considerably inferior to those obtainable on tissue made with the bichromate salt in it. The ready sensitized tissue is now an article of commerce; it is sent out in a very convenient form by the Autotype Company, and gives the very best results.

The operator who works on a large scale, or who is fond of experimenting, can make his own tissue. This is not such a very difficult thing to do as most appear to imagine. We give a formula for the mixture in the Year-Book, and in a recent number of the Photographic News we described a method of coating paper which is particularly suitable for the preparation of carbon tissue. The tissue must be dried with but little heat in a current of dry air. There is no place better than to light a very large fire in an ordinary room an hour or two before coating, so as to thoroughly dry the place, and, as the fire sinks low, to hang up the tissue in front of it. Of course, no daylight may be admitted, but if the operation be performed at night, the tissue will be dry in the morning.

The exposure is the thing that probably frightens amateurs more than anything else. The very name of an "actinometer" has something terrible about it that frightens the amateur away. But really the exposure is a very simple matter, especially as there is a very great latitude. We should advise the photographer who attempts carbon printing for the first time to work without any actinometer—or rather, to use a common negative as an actinometer. He should select a few negatives of good quality to print from in carbon, and select those which he knows take about the same time to print. He should also select an additional negative which would take about as long to print as the others. Under this last mentioned negative he should place a piece of silver paper. We shall have a word as to what kind we consider best. When this is printed the carbon tissue may be removed from the other frames.

But if carbon printing is to be regularly carried on, some sort of actinometer is probably a necessity; and the old single-tint actinometer is certainly one of the most convenient, but it requires constant attention to watch when the tint is reached, and then to change the paper. An actinometer which has a series of tints of varying opacity, under which the sensitised paper is placed, will be found to be useful in many cases. Each tint has a figure or some opaque object printed on it, so that it is easy to detect the faintest colouring of the sensitised paper under it, the figure standing out white against the coloured ground. Sawyer's actinometer is a very handy instrument, based on the principle just explained. Warnerke's sensitometer may be used as an actinometer by placing it in an ordinary printing frame with a piece of sensitised paper; but it is a little too transparent. Even with albumenised paper the figure 25 is generally visible by the time that a negative of ordinary density is printed in carbon, so that for an extra dense negative it is necessary to place a second piece of paper in the frame. This difficulty can, however, be got over by placing one or more pieces of tissue paper in front of the screen.

H. J. Burton has recently introduced a very neat actinometer. In this there is a screen of graduated tints, but in place of an opaque figure being placed against each tint, a diminutive negative is used. The photographic mind is thus gratified by being, in a certain sense, able to watch the actual printing of the tissue.

(To be continued.)

FRENCH CORRESPONDENCE.

Stability of Platinum Prints—Use of Eastman Paper—Toning Prints on this Paper with Platinum—Sensitiveness of Monckhoven Plates.

We observe that a new discussion has just taken place in England, on the subject of the greater or less stability of platinum prints. In the Photographic News of January 28th a reply has been given to the objections based on the yellowing of some prints of this kind. We share the opinion there expressed, that this yellowing does not constitute a change in the platinum print, but that it particularly belongs to the paper; further the writer points out that, with a chlorinated liquid, the paper can be whitened, whilst the image remains intact. From the earliest days of platinum printing we have occupied ourselves with researches as to their stability, which we believe to be very great. No print of this kind has with us perished or become in any way changed, whilst all others have weakened; a great number have even faded, because they had silver for their base. We may, however, remark that reduced platinum is susceptible of presenting a tint which is not always the black colour generally possessed by these images. We know that Willis and Co. supply commercially a liquid by the aid of which platinum images of a sepia colour are obtained. If these images are submitted to the action of various energetic reagents, it is seen that they resist them very well, a proof that they are really formed of platinum. A similar modification may be obtained by toning with platinum the images obtained upon Eastman paper. We will point out further on how this toning should be conducted; for the moment, let us admit that it has been done, and we immerse the proof thus toned in a twelve per cent. solution of bichloride of copper. All the silver which has not been replaced by platinum will be transformed by the bichloride of copper bath into white chloride of silver. The platinum deposited on the silver will alone remain visible, and it will be remarked that it has a sepia colour. We find ourselves then in the presence of a molecular transformation of platinum which gives it another colour; and that the images are not on that account less gifted with stability, for, equally with impressions in black platinum, they are unattacked by those reagents which the latter resist. It may be that under the slow action of sulphuretted hydrogen, reduced black platinum suffers transformation into yellow or brown-sepia platinum. In such a case change of colour does not imply the gradual disappearance of the image; it appears to remain all the same, but in place of being black, it will be brown. We have never up to the present seen a like modification spontaneously produced; and we only speak of it to point out the possibility of such a thing taking place under particular influences, under conditions assuredly far removed from the normal ones engaged in the production of these images. In conclusion, we believe, if not in the absolute stability, at least in the very great stability, of impressions in platinum, and we add that the possible transformation of platinum reduced in a black colour, into sepia coloured platinum, is a mere change of colour not in any way inducing less stability of the image. Finally, we have not up to the present seen any example of a spontaneous transformation of black platinum into sepia coloured platinum.

Use of Eastman Paper; means of increasing the stability of prints on this paper by toning them with platinum.—The most serious objection that has been made against the use for positive printing of gelatino-bromide of silver papers such as those of Eastman, is that the images given have silver as their base, and consequently are destined to undergo a change sooner or later. Silver is, in fact, a metal which is attackable by the greater part of the acids, by sulphurous gases, and by oxygen; and whatever may have been said on the subject of images printed on bromide of silver paper, we have the conviction that they do not fulfil the conditions required for absolute permanence, such as exist in images having carbon for their base, or even in those formed by reduced platinum. However, it must be admitted that these papers, so sensitive as they are, and capable of being printed at any time by the aid of any kind of artificial light, offer advantages that must not be despised; they have a great advantage from this point of view over all other preparations suitable for positive printing, more especially over what is known as platinum paper. This last is very expensive, on account of the necessity that exists for introducing a large quantity of chloride of platinum into its preparation. Besides this, the exposure to daylight must be nearly the same as that required by albumenised paper prepared with chloride of silver. It appeared to us that the difficulty might be overcome by transforming images of reduced silver into images in platinum, by means of a simple toning such as takes place with images on albumenised paper. Thanks to this addition, the Eastman and all similar processes are no longer open to any serious objection; and they will henceforth unite rapidity of printing with solidity of result. Following out our idea, we propose to complete the development formula published by the Eastman Company in manner following:—After development with ferrous oxalate, and washing in water acidulated with acetic acid, the prints are immersed in the toning bath composed as follows:

Bichloride of platinum...	... 1 gramme
Water	... 2 litres
Pure hydrochloric acid...	... 30 grammes

The prints are left in this bath sufficient time for them to be well covered with a good coating of platinum, this metal being gradually substituted for the silver. The image is weakened under the action of the toning bath; therefore over-exposure is necessary, as is the case with impressions on albumenized paper. With a little practice, it is easy to know what the proportion of this over-exposure should be, and also the time necessary for the immersion in the platinum bath. To verify whether the toning action is produced, and to appreciate its intensity, have at hand in a small dish a solution of 12 per cent. of bichloride of copper dissolved in water. Before toning, the image on a fragment of a print plunged into this bath will completely disappear, the reduced silver being transformed by the bichloride of copper into white chloride of silver; but as soon as the deposit of platinum has begun to take place, this metal not being attacked by the liquid in question, an image at first feeble is seen to remain, becoming more and more powerful in proportion to the time of immersion in the platinum bath. Images thus produced are indestructible; for admitting that that portion of the image which is of silver may completely disappear, there will always remain the platinum image, somewhat attenuated, it is true, but quite complete, however, if the duration of the exposure and development have given an intense proof. If all the silver image has disappeared, we shall obtain the change of colour referred to in the first part of this letter. There will remain an image of sepia colour; and we may assure ourselves, without waiting for it, of the effect of any alteration due to time, by plunging, after toning, the entire proof into the bath of bichloride of copper. All reduced silver which has not been replaced by platinum will be transformed into white chloride of silver; and what remains visible is an image formed solely of platinum. If it is desired to preserve it as such, there is nothing further to do than to place the image in hyposulphite of soda to dissolve all the chloride of silver, and an image will remain formed exclusively of platinum. It may be that in studying this question more deeply we may succeed in forming on the silver image a deposit of platinum of a black colour. We are now engaged in experiments having this end in view. When a proof has been passed through the bath of bichloride of copper, in order to ascertain the amount of platinum that has been deposited, it may be easily restored to its primitive condition by immersing it, after washing it in three waters, in a bath of ferrous oxalate identical with that which has served to carry on the development. The image immediately regains its original vigour, and there is nothing to prevent its being afresh submitted to the action of the toning bath for a more complete platinisation if required. It will be noticed that when the image has been made to disappear in the bichloride of copper bath, it becomes more brilliant and of a bluer black tone when re-constituted in the ferrous oxalate bath. We may even, thanks to the use of this bath, succeed in reducing a too vigorous impression. This offers a very important advantage when enlarged proofs are in question. In such case we must over-expose, because we have the power of afterwards very easily bringing back the image to the desired depth. From what has just been said, it naturally results that positive gelatino-bromide of silver papers conduce to applications which are of very great interest, and which could not be realised with so many advantages by any other sensitive preparations. We shall return on another occasion to these applications, which would lead us too far just now. We only insist that platinum toning allows us to obtain at less cost than by any other means, images having platinum as a base; and under conditions as to rapidity, of great value. We believe we render a service to our photographic brethren by pointing out a method destined to extend the field of their labours. No one has up to the present, so far as we know, published the means of assuring the permanence of impressions obtained upon gelatino-bromide of silver papers, at the head of which we do not hesitate to place those of the firm of Eastman and Co.

Increased Sensitiveness of Monckhoven Plates.—The firm of Monckhoven has just modified the sensitiveness of its gelatine plates, by giving them greatly increased rapidity, without in any way impairing their traditionally excellent qualities. The photographic public become more and more difficult to satisfy in the matter of sensitiveness; this is easily understood, since instantaneous productions have become so general as almost always to take the place of operations with a normal exposure. The important point in plates of high sensitiveness is that the preparation should be free from tendency to fog; this very valuable quality characterises the new Monckhoven plates; we are gratified to be able to make this statement after having made conscientious trials of them. Leon Vidal.

THE COMIC SIDE OF PHOTOGRAPHY.*

BY CHARLES E. PEARCE.

Punch has always approached photography in the gentlest of moods. Its satire has ever been characteristically English. French artists, as we have seen, came down very heavily upon the poor photographers for their lack of art-knowledge, but our English caricaturists have always regarded photography solely from the social point of view, and their fun is consequently broader and less bitter.

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* Continued from page 837, vol. xxx.

Of course it must be remembered that a comic artist draws for his public, and as the English public troubles itself as little about art as it does, on the authority of Sergeant Buzfuz, about a warming pan, what is the use of satire which the public does not understand? John Leech, who is responsible for most of the *Punch* "hits" at photography during the early days of art, certainly guaged the public task if a humourist-draughtsman ever did, and was not an artist in the sense in which the French regard the word. Hence his humour appears now-a-days extremely mild.

Take one of the earliest drawings in *Punch*, for instance. It appeared in the spring of 1856, just at the time when a stereoscope was a necessity in every house. "I say, sir," says one of Leech's inimitable boys to a specimen of the well-known swell with sprouting whiskers and a "dog collar," "heave us up to have a look at them pictures." And hanging by the side of the shop of a photographic dealer is a case with four supposed stereoscopes, bearing the inscription, "Stereoscope slides for the million. Look steadily with both eyes. Boys keep your hands off." There certainly does not appear much that is funny in this, and as for the stereoscopes, they are impossibilities, showing that Leech, like a host of other English comic artists, was careless about the absolute appearance of the thing he tried to caricature. The next allusion is in the summer of 1856. The drawing, a small one, bears no initials, but has the touch of Leech. It is "A hint for a photographer's tent," and represents a young gentleman with what appears to be a huge Panama hat on his head from which are suspended sundry bottles, while slung to his waist is a travelling bath with lid and clamps complete. The second half of the drawing shows the tent in use, in shape resembling a shower bath, and drawn down from the aforesaid hat, the brim of which forms the top of the tent. Apart from the ingenuity of the idea, there is a point here in the caricature of the enormous felt hats which photographers in those days used to affect.

The public, by this time, have been taught to know what a negative looks like, and a drawing, not by Leech (probably McConnell) of the disgust of a gallant Crimean hero on seeing a "negative proof" of himself, would fall rather flat now-a-days; neither is the drawing itself particularly comic.

In the Almanac for the same year Leech is at his best with an intensely funny drawing, entitled "Hi' Art!" Says a stout middle-aged lady of the sitter, a chubby urchin: "I should like you to be very particular about his hair." Upon which the photographic artist replies: "Oh, mum, the 'air is heasy enough! It's the hi's where we find the difficulty." The drawing of the photographic artist (after the word "artist" Leech has put a sly note of interrogation) is delicious, and the photographers of 1856 must have had a good laugh at the pleasantry.

Leech is equally happy with a drawing in May, 1857, wherein he pourtrays the misery which the public then experienced at the hands—literally—of the tribe of "doorsmen." "Art progress," the carricaturist calls his picture. Artist (!): "Now mum! Take orf yer 'ead for Sixpence, or yer 'ole body for a Shillin'!" Here we see an unfortunate British matron, surrounded by a trio of ruffianly fellows, of a decidedly burglarious appearance, who are contending for their prize; while a fourth is gently propelling a young lady and her military swain within a doorway over which is inscribed, "The Original Photographic Establishment: an exact likeness and a rasher of bacon for 6d." The rival establishment into which the British matron is being enticed, or to speak more plainly threatened, proclaims itself a Portrait Gallery. "All likenesses warranted kerrect. No large mouths or white eyes made here. No deception!" So far as the "doorsman" is concerned, the picture does not exaggerate in the least. A more impudent race never existed. The "doorsman" was always a mystery, and he is a mystery still. Where did he get his mixture of banter, insidious persuasion, and bullying from? What was he before he became a "doorsman?" And what profession did he drift into when the photographic mania was over, and a "doorsman" was a useless expense! Too little is known about this singular being, and if a specimen still exists he ought to relate his experiences for the benefit of the present generation.

The Euston Road "dramatic study," which used to be popular in the stereoscopic form as caricatured by Leech, is even more funny than the same thing as rendered by Marcelin.* It is called "The Artistic Studio—A stereoscopic scene from fashionable life," and represents a lady in the crinoline of the period listening to the addresses of a young gentleman in evening dress who is on his knees. At the back is another young gentleman also in evening dress, but with light trousers, standing over the group, and holding a dagger of portentous size. The ferociously curly hair, the stage frown, the huge necktie, and the handkerchief which is peeping from the coat-tail pocket, are delightfully pourtrayed. The photographer, in his shirt sleeves, has his head under the focussing-cloth, while standing by, in a half critical, half admiring pose, is a friend. A coffee pot on a shelf behind the photographer, and a cat peeping through the roof, add very much to the *negligée* aspect of things. This studio is obviously not for ordinary portraits, but for the production of those wonderful dramatic scenes which were the admiration of our fathers. The legend attached to this picture fully explains it. "Love, Pride, Revenge. The Group represents a Young Minstrel of humble origin, declaring his Passion to a lady of Noble Parentage. Her haughty Brother, as may be seen from his menacing attitude, is about to Avenge the Insult offered to his Family!"

The photographic mania which infected everyone at this time is touched upon in the autumn of 1857. A shoeblack is standing with his back to some railings in which is hung a camera. "Here you are, sir," says the boy to ineffable dandy in "pegtop" sleeves and trousers, "Black yer boots, and take yer likeness for the small charge of threepence!" We have not descended so low as to "throw" anything "in" as an inducement to be photographed, but the camera in the street—an absurdity in Leech's time—is now a familiar fact: another verification of the adage that many a true word is often spoken in jest.

In June 1858 Leech again notices the "doorsman," and the hit at his oily persuasiveness is very happy. The "doorsman," who has gin written on his nose, and shabby gentility and impertinence in his misshapen white hat with its mourning band, is saying to a rather pretty girl, "'Ere is wun of Myself, yer see, miss, and I'll warrant yer a equally 'appy likeness, Miss." It was rather too bad, perhaps, of Leech to invariably call the "doorsman" an "artist," as the "doorsman" rarely officiated in the studio; but no doubt Leech erred as Dr. Johnson did in describing the pastern of a horse—through "pure ignorance."

A week later photography again comes in useful, but this time it is the sitter who is laughed at. "I say, mister," says one of two abominably ugly coal heavers, "here's me and my mate wants our fotergruffs took; and mind we wants 'em 'ansom, cos they're to give to two ladies." A clever point in this picture is the indication of the elevated position of the studio, a rule almost without an exception in those days, shown by a "nice derangement" of cowls and chimney pots just peeping through the roof.

(To be continued.)

STUDIES.

BY W. ADCOCK.†

By the title I give to this short paper, I mean detached parts of pictures, as distinct from those composites which, when joined up and employed, we, in a certain sense—not its highest—call a picture. If, in a landscape, we take foreground, middle, and extreme distance, we get the elements necessary to a picture. If, of these, we take one section only, we should probably call it a view. Now if, out of the foreground, we took a large thistle and produced it separately, we might, however pictorially it was treated, very properly consider it a study.

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* Continued from p. 789, vol. xxx.

† Abstract of a paper read before the Photographic Conference.

Similar ideas apply to figure. To get a picture, we should look beyond a mere bald figure for accessories to give completion to it. In the production of a large and elaborate photograph, we can easily see how necessary it would be to study every part separately. The pose of a model, the turn of a head, the exact expression, the disposal of the hands, the folds of drapery, the position of a chair—all would be worked out, not merely by thinking of, but by producing pictorially. In this, photographers only follow in the wake of painters, who, fortunately for the world, give it their first and upward thinkings towards perfection in the form of studies.

We know how a painter, when thinking of a great work, first makes studies of its parts, then of its components as a whole—often more than once—before he decides how he will treat his finished work. It has been so from the earliest days of art, and the studies of the old masters are amongst the treasures of the world.

It is, I take it, safe to predict that a great master in photography, before deciding upon such a work as "Dawn and Sunset,' and while the subject is incubating in his mind, would make many studies of its parts. But I aim to-day at creating an interest in one special class of studies. If we go to the Kensington Museum we find studies of hands—for instance—that, from the interest attaching to them, are almost priceless. Why is this? It is because of the marvellous beauty of their drawing. It is notorious that, to the incompetent artist, hands are more difficult to draw than faces, and it is common to find, in otherwise fine pictures, a shirking of the hands. They are often an indication of something left to the imagination to say what. In new pictures remonstrance with this defect is met by the remark, "Oh, do not detract from power of the head by minor details." This interpreted means, "We don't profess to paint hands." Yet, hands give great scope to the master for brush-drawing. Can we, by camera and lens, take hands or feet, enlarge them to life-size, and produce perfect drawing? Can we not produce every line of graceful beauty found in the hand of girlhood, the muscular vigour of manhood, and the loose wrinkled skin of age, with a fidelity few capable draughtsmen would spend time in producing? Before we give a negative reply to this, I say, let us try.

Is another hint here? Would hands, and feet, and eyes, and ears, so produced, have value as copies in our schools, Board and otherwise, where drawing is now so largely taught? This seems to me a question for a professional. I hold up the hint in large letters. If worth anything, use it; if not, let it go.

Perfect drawing, to the trained eye, is ever a thing of beauty. With the lens, perfect drawing can be unquestionably obtained by taking small, and enlarging.

What to-day would be the value of a photograph of the hand of Wellington, or say the sword hand of Murat? If these things would be prized by a nation, will an exact pourtrayal of your hand be without interest to your grandchildren?

The power of enlarging given to amateurs by bromide paper is almost illimitable. I am a convert to this, that he who will afford a large lens with advantage, may; while he who will be content with a small rapid rectilinear (say 8 inch focus) may produce splendid work, both directly, and by enlarging. And here, at the risk of telling those who know, I tell all who do not, a lens that will take a plate sharp to the edges, will enlarge that plate to any required extent. With the size I have named, I take 7½ by 5, and enlarge up to 23 by 17.

I tell you the facility of enlarging gives you over all these things a power of making of them things of beauty. One advantage is they are at hand, and you have not to go ten or twenty miles to find them.

Let me say there is nothing in the study which will bear careless manipulation. The diffused bluntness I have held permissible, if not advocated, in large direct work, will not serve in enlargements. A negative must be sharp all over, or those parts out of focus would, by enlargement, be terribly out of drawing; and what I am holding up for is *beauty* of drawing.

To the beginner, and to those who have a bad one, I say, get a good lens. Do not expect, for thirty shillings, an instrument as good as at some makers you would pay five pounds for. Let me not be understood as advocating these studies to the exclusion of other and more extended work—to landscape, to seascape, to figure in every phase. What I say is, that in studies, taken small and enlarged, you have a class of work second to none in interest—work that, by the very care and thought you give it, will befit you for pursuing with more intelligence than you would otherwise possess, every phase of picture of which photography is capable. Some of the studies I have suggested may be considered photography made easy. I may be asked, what scope does a turkey or a brace of hares give for showing the art side? I reply, the lines, the lights, the shadows may be harmonious and exhibit good taste from one arrangement, but obtrusive and exhibit bad taste in another.

I enlarge by daylight, and the cost of adapting a camera to the purpose did not exceed 3s. 6d. Nothing done to this camera prevents me using it for ordinary purposes.

I cannot forbear saying here that, apart from my advocacy of hands and feet as specially worthy every one's attention, it is to the studies attainable from the human figure generally, I look for the greatest pleasure, the greatest instruction, and the easiest attainments.

I think, to the amateur, there are some ruts in the photographic road. A certain make of plate may be a rut. Beach's developer is a rut, photographic time-tables are an awfully deep rut. Landscape only, is a rut, and, yes decidedly! everlasting figure must be another.

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TESTING THE SENSITIVENESS OF PLATES.

BY W. K. BURTON.*

The term "testing the sensitiveness of plates," is one which should scarcely be used at all, for it involves the supposition that we have some standard or unit of sensitiveness, wherewith we may measure, or in terms of which we may state, the sensitiveness of plates. Now we have no such standard, and, so far as I can see, are not likely to have one. For this reason the only thing that we can do is to compare the sensitiveness of plates, and I shall presently show that even this is impossible with anything like accuracy. I shall, however, say a few words on the practical methods, whereby we may compare approximately.

First, we have sensitometers. The principle of these instruments is well enough known. They are—or would be, were they accurate—a means for measuring the smallest amount of light that is capable of producing any developable image on a plate, the assumption being that the sensitiveness of the plates is in the inverse ratio of this amount of light. Thus, for example, if it takes only a quarter the amount of light to produce a developable image in the case of plate A that it takes in the case of plate B, plate A is four times as rapid as plate B, and it is assumed that it will give a similar negative in a quarter the time. But for this assumption there are, I believe, really no grounds; at any rate, we certainly have no right to take it for granted. And as it happens, it is not correct, or is, at any rate, only correct to a very limited degree.

The very fact that a supplementary exposure has the effect of greatly decreasing the amount of light necessary to produce a developable image, whilst it scarcely appreciably increases the camera sensitiveness of a plate, shows that the rule does not of necessity hold good.

For example, if we have a plate which would require eight units of light to produce a developable image, and we give it six units by exposing it to diffused light, it will evidently require but two more units of light—received through the sensitometer screen—to produce a developable image, but the plate will certainly not be four times as quick after it has received the supplementary exposure as before.

Now, the question is, do we not have plates differing in their actual construction, somewhat as the plate we have imagined differed before and after it had received this supplementary exposure?—plates, that is to say, whose variation in sensitiveness is not in the inverse ratio of the quantity of light necessary to produce a developable image. I certainly believe that we have, and I think it is very easy to show this.

We take a plate of the very highest sensitiveness, such as shows 25° on Warnerke's sensitometer, and we take another plate, say, about ten times as slow. It may show anything from 8 to 13 or 14. We now expose the second plate for such a length of time that we get an impression of the figure 25 on it, and we compare the two images. We shall see a vast difference.

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* Read at the Photographic Conference.

The last row of five figures in the very rapid plate will be a mere shadow, and the second row will be but little better. In the case of the slow plate, which has had the very long exposure, figure 21 will probably show with a fair amount of distinctness, and in the second row from the end—figures 16 to 20—the density will rise very rapidly.

It will probably have have taken from twenty to thirty times as long exposure to get out the figure 25 on the slow plate as on the quick plate, but if we give the two plates exposures in the camera, varying as 20 or 30 to 1, is it to be supposed that we shall get two similar negatives? We certainly shall not. If we have been, in both cases, on the under-exposed side, we shall find that we have, perhaps, exactly the same amount of shallow detail in both cases, but that great part of the detail which is thin and ghostly in the rapid plate is strong and vigorous in the others. Nor can we, by varying the exposures in any way we choose, get precisely similar negatives in the two plates. The curves of sensitiveness are not the same, and no possible exposures will give negatives precisely similar. All that we can do is to produce on each plate that somewhat indefinite article, a "properly exposed negative." We may give the slow plates such an exposure that, whilst we have the very deepest shadows rendered on clear glass, we have all the detail strong and vigorous. We shall, however, find this impossible with the rapid plate, for we must expose till the extreme shadows are considerably veiled, before we get that vigour of shadow detail which will entitle the negative to be called "well exposed."

It is on account of the differing "curves of sensitiveness" that we cannot really even compare with accuracy the sensitiveness of different plates.

There are, however, methods whereby it is possible to perform this comparison with approximate accuracy. Indeed, the very fact that we are able to speak of one plate as four or eight times as rapid as another is proof of this. I believe, however, that the only method of comparison which deserves the name of even moderate accuracy is that of giving, with the two kinds of plates to be compared, such exposures in the camera that each will produce a "properly exposed" negative, and comparing the exposures required to produce this result. The subject should be one having a great range of tint, for example, a white statuette draped in black velvet. It is thus possible to judge of the plate, as regards its capacity for rendering a range of tone as well as its sensitiveness.

Even by the intelligent use of a sensitometer it is possible to get a comparison of sensitiveness which, if not even as accurate as that got by making two camera exposures, may still be of some practical use.

As to the sensitometer to use, there can be no doubt that those sensitometers in which the light is measured by passing through apertures of varying size are the most accurate; but Warnerke's sensitometer has come so much more than any other into general use, that when a reference to "the sensitometer" is made, it is understood to refer to Warnerke's instrument. His sensitometer, as everyone knows, consists essentially of a screen divided into twenty-five squares, each of which has a transparent film on it, which obstructs more or less of the light. The squares are numbered from 1 to 25, 1 being the most transparent. The instrument, apart from the subject of the light, to be mentioned hereafter, has several drawbacks. Thus the opacity of squares bearing the same number is by no means precisely the same in all screens that have been sent out. Again, in any one screen, the difference of opacity, or of transparency, as measured by amount of light allowed to pass, is not proportionately the same between each contiguous two squares throughout the screen. Still, its convenience is so great that it will probably be a long time before Warnerke's sensitometer is superseded by any other.

Now as to the light. That proposed by Warnerke is a luminous tablet, prepared by coating the back of a sheet of glass with sulphide of calcium in solid paraffin. The idea is ingenious, but, unfortunately, it does not appear to give the very best results in practice. The amount of light emitted not only varies between one screen and another, but it also varies from time to time in the same screen, the tendency being, apparently, for this screen to become less luminous through time—that is to say, capable of absorbing a less quantity of light.

It cannot, however, be contended that a slight variation in the light used for a sensitometer is a matter of great consequence, because, although each step or degree in Warnerke's sensitometer is so great as to be represented by an advance of 33⅓ per cent., two contiguous squares being intended to allow amounts of light, varying as 4 to 3 to pass; yet these degrees are so fine, or rather the capacity for observation is so poor, that it is all but impossible to read to a single degree, the last two or three figures being so faint, that it is almost impossible to tell just which is the last. For example, we sometimes come to the conclusion that 20 is the last figure visible, and then, turning the plate to a certain angle, we see one or two figures more. This being so, a variation of say five or ten per cent. in the light used cannot be considered to be of much moment, and, in fact, a gas-burner with any good regulator does not vary so much as to render it unsuitable for use with a sensitometer, it being understood that no attempt is to be made absolutely to *measure* the sensitiveness of plates, but merely to compare the sensitiveness of one with another.

The method of procedure which I recommend is as follows. One of the two plates to be compared is exposed to the burner at a fixed distance for any length of time that will give less than 25° on development. The plate is developed and fixed. A certain square is now selected, which shows a density about equal to the density of a piece of shadow density in a negative. The next operation is to give—by several trials—such an exposure to one of the other batch of plates that the same square will show the same density. The sensitiveness of the plates is then, approximately, inversely as exposure required.

I do not wish to condemn altogether the method of exposing two plates, under the sensitometer, for the same length of time, and of comparing the results after development. On the contrary, this is my own continual practice; but then I do not pretend to be able to tell with any degree of accuracy what are the relative sensitivenesses of the two plates exposed, and even the kind of idea that I am able to form is got by judging, not of the last figure, or of any one particular figure, but by taking into consideration the whole range from beginning to end, and it is the result of long practice that any useful information can thus be obtained.

When I advise that gaslight be used, I am leaving out of consideration isochromatic plates. These may, of course, not be compared by gaslight with ordinary plates, for sensitiveness to daylight. The slight difference that there is between one ordinary plate and another with regard to its sensitiveness to yellow light does not appear to vitiate the tests performed by gaslight. The plate which is most sensitive to gaslight is most sensitive to daylight (amongst ordinary plates), and to practically the same degree.

A word as to the developer to be used. There is a cry amongst some that it is necessary, before we can get a standard of sensitiveness, to have a standard developer, to use—that is to say, the same developer for all kinds of plates. Now this appears to be the most idiotic and meaningless proposal that ever was made. It seems to me to stand to reason that every plate should be developed with whatever developer suits it best—gives, that is, the best results with it.

We do not want to know the sensitiveness of a plate used with a developer which is, perhaps, particularly badly suited to it. What we want is to know the sensitiveness of a plate as that plate is used in practice—which is, or ought to be, with the developer which *best* suits it. To require that the same developer be used for all kinds of dry-plates, when it is a case of testing sensitiveness, appears to me to be about as sensible as it would be, with the same object in view, in regard to a wet collodion plate and a dry gelatine plate, to insist that both be developed with the same developer—with alkaline pyro, for example.

RATIONAL DEVELOPMENT.

BY ANDREW PRINGLE.*

The immediate object of my remarks is to draw attention to the effects of modifications in development, and to suggest how we may use these modifications, so as to get, not merely what we call "good negatives," but negatives that will give us prints correctly and artistically reproducing our subjects, and, moreover, reproducing them in the aspect we desire. When we buy a dozen plates, we get with them a formula more or less arbitrary and intricate; these formulæ are useful, as suggesting the normal qualities or the weak qualities of the plates. For instance, when, with some trouble I have analysed a developing formula, and find an unusual quantity of pyro, I at once suspect that batch of plates to be one likely to give me thin, poor negatives, unless I take care. When, on the other hand, I find the formula gives a less than usual quantity of pyro, I expect a plucky, perhaps hard, negative, apt to want half-tone. When I find the alkali larger in proportion to the restrainer, I suspect the maker of a wish to get for his plates a reputation for great rapidity; and when I find the restrainer powerful, I expect a plate with just a tendency to fog, or else a plate intended to allow of a long exposure, such as some workers seem to demand. Every time that I get a new make of plates I analyse the developing formula, and carefully note the proportions of the ingredient, but I never attempt to make up a formula precisely in the arbitrary and, as a rule, intricate manner formulated. But surely, no man in his senses can ever dream that any one formula will suit every case; anyone who has developed a dozen negatives must surely know better than that. And yet I venture to say that a vast majority of us try to develop all our plates alike, be our subjects what they may. Mountains, waterfalls, glens, churches outside and inside, clouds, seas, glaciers, coal-mines—all alike, "15 drops of A, and 5 of B." That is what the maker's formula says, and who should know, if the maker of the plates does not? After our development has gone a certain length we find the need for modification, but we always begin with the formula.

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* Abstract of paper read at the Photographic Conference.

A formula ought to be simply a convenient method of keeping our reagents, and—the important point—of getting precisely the quantities of reagents that we require. A formula cannot be too simple. There is nothing talismanic in half a grain, nor any virtue in such a number as $7\frac{3}{16}$. What we want is to get, without trouble or loss of time, a certain quantity, not of A or B, but of certain known chemicals. A formula should be of such a nature that you can't measure it without knowing how much of its essence you require. Now, I do not care what strength we make our solutions, so long as we know precisely what they are, and how to extract from them precise quantities of our reagents, but for development I find 10 per cent. solutions by far the most convenient. Everything that is not used stronger than 10 per cent. I keep in 10 per cent. solutions—pyro, ammonia, bromides, citrates, potash, soda, gold chloride, soda acetate, &c. Put an ounce into a measure, and make up to ten ounces after solution—that is the whole affair, and ten minims are always equal to one grain; or, put in a dram, and make up to ten drams; or, put in fifteen grains, and make up to 150 minims. In all cases ten minims equal one grain. The advantage of this, or a similar, method is, that one is bound to know what quantity of reagent is used, and so development becomes an intelligent, not a blind, operation.

One formula, in particular, appears to me to be of the "talismanic" order, which quality accounts, no doubt, for its seeming popularity among amateurs. I hardly ever see an amateur paper without some question or other about the "Beach" developer—so called, I understand, after the illustrious President of the New York Amateur Society. I confess I never made up a developer in this precise fashion, so there may be in it some virtue unknown to me; but as it stands in the Almanac of this year, it looks to me anything but promising. In the first place, it is a mixture of avoirdupois ounces—not exact—and chemical ounces, which is a bad start. Then it contains a very extraordinary proportion of sodic sulphite when the developer is mixed complete. I cannot see any need for such a quantity, even if sodic sulphite is the best, or a good preservative, which, lately, I have began seriously to doubt. The pyro solution looks something like ten per cent. (Mr. Beach states that one drachm contains six grains of pyro, which means ten per cent., but I have not tested this), but the potash is an arbitrary measure, and calculation is required to discover how much potash we have in "twenty minims or a quarter of a drachm." If you want a good and perfectly simple pyro solution, dissolve a chemical ounce of bisulphite of potash in about eight ounces of water, and mix in a chemical ounce of pyro, finally making the bulk to ten ounces. As pyro is sold in ounces of 437½ grains, if you want to be very accurate, make the bulk to 4,375 minims = 9 ounces 55 minims. This requires no addition, works beautifully, and keeps for a very long time.

Never, on any consideration, should the chemicals be mixed. The great advantage of keeping each chemical separate is patent when we consider my next point, which is that very seldom ought two consecutive negatives to be developed precisely alike. If our two consecutive plates were exposed on the same or similar subjects, then, after our first is developed and examined, we may be able to improve the next by modification of development. If the subjects are different the development ought probably to be different, and this brings me, at last, to the real gist of my argument.

I say different subjects require not only different exposures, but different development, and on the development depends, not only the technical quality of our negative, but also the artistic quality of our prints. If anybody is inclined to sniff at this statement, let me ask him to use an extreme case. Take an interior, a dark one lighted here and there by windows. Certainly a negative of such a view would not be developed in the same way as an open landscape negative. These are, perhaps, the two extremes, but between these there are an infinite number of gradations, some of which I will touch upon.

When we have a wide open landscape without any marked foreground, we are certain to run a risk of wanting contrast, as well as fog in the distance. I would develop such a negative slowly, with plenty of restrainer and pyro, but I would develop it fully. An interior is different; we are certain to have violent contrast, so I should, in that case, keep down, or omit, bromide, use very little pyro, but a good strong dose of alkali, and I would not develop it nearly as much as I did the open landscape. Take the case of a landscape not stretching to any great distance, but having a dark foreground of foliage. What we have to fear is the distance becoming too dense before the foreground has all its detail out. Here again I would certainly begin with little bromide and pyro, but a good dose of alkali, and as soon as I had the dark details out I would add pyro, and bromide and alkali, if required, and this negative I should develop rather quickly, compared with my open landscape, for long development means contrast, *cœteris paribus*. When I fear under-exposure, I keep down pyro and restrainer, and I rather concentrate than dilute my developer. I do not believe at all in the system of watering the developer in such a case, though I know it is recommended by some. I have made many trials with various developers, and I always succeeded better with a short and sharp developer than by a watering and waiting.

In development we have a mighty instrument for rendering expression. It is, however, impossible to lay down rules hard and fast for the use of the developer, but I shall give a few very general hints on the subject. Lightsomeness, brilliance, contrast, *allegria*—it is hard to find a name for the quality—may be expressed by slow development, plenty of pyro and bromide, and full development. Gloom, mystery, age, and "all that sort of thing, don't you know?" are more likely to be expressed by a small quantity of pyro, with just enough alkali to give the details required, and in this case the development may be shortened.

In portraiture, development should not be carried nearly so far as in landscape, and just enough density should be acquired to hide facial colour defects. If an outdoor group can be made into a good picture at all, it will probably be done by a good quantity of pyro, and alkali sufficient to bring out all the detail. But I find groups very difficult, on account of the diffusion of the light.

In regard to the alkalies used for development, there seems to be a considerable diversity of opinion. I always use ammonia when I can, but I have no particular objection to soda and potash. Using ammonia, you can have no restrainer if you choose, except that "evolved" from the emulsion; with potash and soda, you have a restrainer, whether you like it or not. If my plates are not tolerant of ammonia, I put them in the fixing bath unexposed, but I have lost far more plates from using soda and potash than ever I did from red fog, unless I was using very old plates.

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Notes.

The report this year of the Photographic Society of Great Britain contains several points of interest. As the Annual Exhibition may be taken to reflect the progress made in photography during the year, any change it shows, either in the character of the pictures or their number, is of some significance. The report, for instance, notes that there was a falling off in the number of landscapes shown in 1886 as compared with 1885, and this diminution, it suggests, is due to the tendency of late to produce works of a larger size. As, however, the quality of the work shown was higher, the loss numerically is amply compensated for. The spread of photography among amateurs has naturally resulted in a great influx of contributions, many of which, says the report, were not up to an exhibition standard; but how many were rejected in consequence the report does not state.

The financial statement read by W. S. Bird was to a large extent a supplementary report. The awards were always a burning question, and it would seem that the Council are not altogether satisfied with the plan of appointing only photographers as judges. Anyway, the statement hints at the possibility of going back to the old method of asking two artists to act in combination with photographers. It is satisfactory that the matter of the damaged frames has been thoroughly enquired into, but not so satisfactory to find that the complaints were well founded. The injuries appear to have arisen from two causes: firstly, the inability, owing to the restrictions imposed by the landlords of the Gallery, to pack the pictures in the Gallery itself; and, secondly, from the manner in which many of the pictures were framed. Nails and projections, caused by the backs not being flush with the edges of the frames, in many cases rubbed against the frames of other pictures, and so scratched and otherwise damaged them. Promises are held out that greater care will be taken in the future, and this, coupled with the advice that exhibitors should also look to the framing, may encourage one to hope that the annoyance will not happen again.

The proceedings in connection with the annual meeting of the Camera Club Convention passed off very successfully. A smoking *conversazione* was given on Monday night at the Club Rooms, which was followed by a conference opened the following morning at the Society of Arts. Captain Abney took the chair, and the papers read were:—"Isochromatic Plates," by W. H. Hyslop; "Studies," by W. Adcock; "Testing Sensitiveness of Plates," by W. K. Burton; "Rational Development," by A. Pringle; "Certain Features in Connection with Enlarging," by J. Traill Taylor; and "Sulphuration of Platinotype Prints," by O'Farrell. In the evening a dinner took place at the Holborn Restaurant, Captain Abney presiding. The toast of the Camera Club was proposed by Valentine Blanchard, who, in contrasting the days when his first practical acquaintance with photography commenced by watching a friend develop a paper negative, and when hyposulphite of soda was sixpence an ounce, with the present practice and cheapness of materials, expressed an opinion that history might repeat itself, and that it was possible photographers might return to paper negatives. Other toasts were given, and the whole proceedings were marked by much enthusiasm. Possessing convenient premises, a great feature of which is a spacious and well-appointed dark-room at all times accessible, the Camera Club offers advantages to photographers of which they ought not to be slow in availing themselves. If continued as it has begun, the Club should have a successful future before it.

The South London Photographic Society is now incorporated with the Photographic Club, a final resolution to this effect having been passed at the Committee meeting referred to last week.

"Wide Angle" writes:—"The exhibition of Italian, French, and Spanish pictures just opened at the Goupil Gallery possesses a certain amount of interest to photographers. The success of the figure studies, such as Gridley's 'Flask' at the last Pall Mall Exhibition, shows there is a future in this direction for photographic art. Pictures, therefore, of the Meissonnier school are invaluable as models of effect, pose, and treatment, because they aim at what photography is capable of—a microscopic fidelity to nature. The modern Spanish and Italian schools have a leaning towards panel pictures of this kind, and in the Exhibition referred to may be mentioned G. B. Quadrone's 'An Amusing Story,' E. Bensa's 'An Amateur Painter,' J. Cooman's 'Pompeian Dancing Girl,' G. B. Quadrone's 'A Soliloquy,' Savini's 'Depeche Amoureuse,' and A. Segoni's 'An Amateur.' Each of these is notable as simple in treatment, and yet indicates sufficient motive to make the picture interesting. It is refreshing not to find any "baby" subjects. Of the nine ambitious works, J. Beulliure's 'Christmas Eve, Church of Alcira,' B. Constant's 'Carpet Seller,' G. Chierici's 'La Polenta,' and J. L. Gérome's 'Master of the Harem,' are worthy of remark."

There is a growing uneasiness among photographers as to the injurious effect arising from the use of ammonia in the dark-room. The fumes appear to attack the mucous membrane, the symptoms varying according to the idiosyncracy of the individual. In one case brought to our notice, the taste has been almost entirely destroyed; in another, a soreness of the tongue is complained of, which does not seem to yield to medical treatment. That ammonia does affect the mucous membrane is well known, and its value in the early stages of a cold has been over and over again demonstrated. But the constant use of a stimulant is a very different matter from its occasional employment when the membrane is in a morbid state. It would seem to be highly important that the modern dark-room should be large and well ventilated. In the matter of ventilation of the dark-room photographers are far too neglectful, yet ventilation is far more necessary now than in the old days, because development is more prolonged, and the operator is cooped up for a much longer time.

But if it be true that ammonia is the cause of the ailments in the two instances we have mentioned—and there may be other cases for aught we know—ventilation and space, though lessening the evil, may not altogether remedy it. The watching of the plate in a dim light necessitates bringing the head over the developing dish, and the mouth and nose are in the exact position for inhaling the fumes. So long as this watching is required, there would seem to be no course open but the wearing of a respirator impregnated with weak acid. But this counteracting influence may in its turn bring other evils, and we hesitate to recommend its adoption. Perhaps the first thing to do is to verify the supposition that ammonia is injurious, and on this point the experience of operators would be valuable.

M. Marey has achieved another triumph in what he calls *chrono-photographie.* He has photographed a gull in its flight, and has obtained a succession of pictures varying from the vertical position of the wings upwards from the body, to the vertical position downward, and so up again to the first position—in all, eleven pictures. He remarks that the duration of one revolution of the wing of a gull measured chronographically, is at least $\frac{1}{5}$th of a second, and as in this print eleven images were represented at equal intervals of time, it follows that each of these intervals represent $\frac{1}{55}$th of a second. As we pointed out in regard to C. T. Mallin's photograph of gulls which we gave as a supplement recently, not one of the positions correspond with the conventional treatment of the artist. M. Marey's paper on the subject, fully illustrated, appears in the *Comptes Rendus* for January 24th.

THE SULPHURATION OF PLATINOTYPE PRINTS.

BY H. H. O'FARRELL.*

Most know what a platinotype print is, and how it is prepared. For the benefit of those few who do not, I will just mention that paper, sized or unsized, is coated with a mixture of a ferric salt and chloro-platinite of potassium, that it is exposed to light in the usual way under a negative, and then developed on a bath of hot oxalate of potassium. Where the ferric salt has, by the action of light, been reduced to the ferrous state, it is dissolved by the oxalate, and at the moment of solution converts the adjacent platinum salt to pure metallic platinum, which forms the image. So much is, I believe, certain, though there are probably other subsidiary reactions which are not quite so plain. The iron salt still remaining in the paper is dissolved out by successive acid baths, and the platinum salt, which is extremely soluble, is washed out with water. There is then presumed to remain in the paper nothing but pure metallic platinum, which forms tho image. As this is an extremely stable substance, the prints have hitherto been supposed to be absolutely permanent.

Mr. Pringle subjected certain platinotypes to the prolonged action of a solution of sulphuretted hydrogen. He then found a remarkable yellowing of the prints to have taken place on the surface of the paper. I have repeated Mr. Pringle's experiments with considerable care, and can confirm the accuracy of his results, as far as they go. I made three series of prints on paper freshly purchased from the Company. With a view of ascertaining whether carelessness in the use of the acid baths would account for the results obtained, I gave one portion of each print one bath of acid, the second portion two, and the third three baths. The third strip had also a much more prolonged washing than either of the others. One-half of each strip I mounted on cardboard for subsequent reference; the other halves were subjected for ninety-six hours to the action of a saturated solution of sulphuretted hydrogen.

They were then mounted, in justaposition with the halves from which they had been torn. I think, for one thing, these examples clearly show that the more or less complete elimination of the iron salt has nothing to do with the discolouration apparent on the prints. This is clear, inasmuch as the third strips are in each case just as badly discoloured as the first or second. This would also show that the staining is not due to iron. The discolouration is entirely on the image side, the back of the paper not being affected. This shows that it is not a deposit of sulphur in the pores of the paper, which would be equally on both sides.

I want you also carefully to notice that the image is in no way affected—a most important point; also that the discolouration is easily removable. The print marked C has been treated with a saturated solution of chloride of lime, which has completely effaced the stain, without apparent injury to the image. The stain is not amenable to treatment with dilute nitric or hydrochloric acids, though dilute aqua regia seems to have some slight effect upon it.

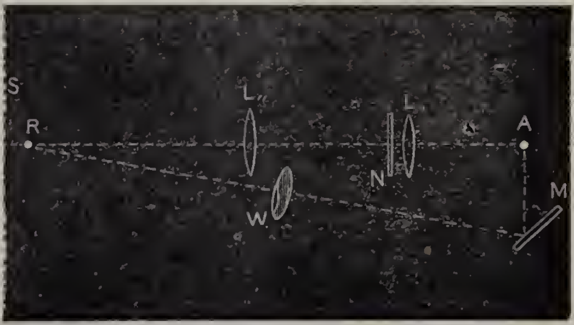
There is, however, one practical warning suggested: if the most permanent results are required, pure, and not commercial, hydrochloric acid should be used in the clearing baths.

MEASURING DENSITIES OF PHOTOGRAPHIC DEPOSIT, WITH REMARKS ON SENSITOMETERS.

BY CAPTAIN W. DE W. ABNEY, F.R.S.*

I do not know whether the following method of measuring the density of developed photographic plates has been considered, but I can say that it is a highly convenient one for various purposes, and one which I am now largely using for certain scientific work which I have in hand.

Suppose I take a plate which has been "sensitometered"—to coin a word—and desire to ascertain its comparative value, how am I to proceed? I will set aside for the present the photographic mode of measuring, and confine myself to the visual, for I think I can show you that the two can run together on all fours, or at all events one can be derived from the other. My mode of proceeding is extremely simple. I simply project the image of the photograph whose density I wish to measure on a screen, and adopt when possible the Rumford method of measuring it. The great beauty of this method is that a perfectly dark room is not required, but that the room may be dimly lighted, and good results can be equally as well obtained. Now, I daresay the objection may be raised—as it is always raised in photometry—that by this plan the two sources of light always vary, and that consequently no trust can be put on the results as being accurate, even should the eye not err. That is a proper objection, I admit, as the method is ordinarily carried out, but for my purpose, where I am not measuring the value of light, but the value of density, I have met that objection completely, I think; it may be I have not, but if not, I shall be glad to learn what there is against the method employed. My plan is as follows, and I show it experimentally in a rough manner:—



The light, whatever it may be, is placed at A, a lens L_1, at distance of its equivalent focus, in this case 9 inches. The negative, N, is placed in front of this, and another lens, $L_{,,}$, throws the image on the screen, S, in front of which is a rod, R, whose shadow is cast by the light coming through $L_{,,}$.

This is the ordinary optical lantern form of apparatus. At one side, at a convenient distance, I place a mirror, M, with the angle so adjusted in azimuth that it refects the light from A over the patch illuminated by the lens $L_{,,}$. This naturally throws another shadow of the rod alongside the first shadow. If desirable, I can place the other lenses, $L_{,,,}$, and $L_{,,,,}$, the latter forming the image of $L_{,,,}$ upon the first patch of light. (As a rule, these last two lenses are unnecessary.) The screen, S, may be transparent or opaque, whichever is deemed best. Where the shadows of the rod fall, I cut out a square mask to enable me to view the two shades without distraction to my eyes by glare from adjacent parts. It will be seen that as the light and the reflected beam are stationary, the method of varying distance cannot be adopted to vary the intensity of the light. To obtain the necessary variation I employ revolving sectors. These sectors are connected with a small electro-motor working with 4 Grove's cells. The aperture of the sectors can be increased or diminished during motion by a simple arrangement. This is an admirable plan of graduating light, and answers for all purposes of the sort. It will now be apparent that should the light vary, the results will not be vitiated in the least, since the original light is made to act as the comparison light as well.

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* Abstract of paper read at the Photographic Conference.

* Read before the Photographic Society of Great Britain.

It will be in your remembrance that last session I brought forward a method of measuring the illuminating value of different colours, and, at that time, I used a candle as the comparison light. This was found fault with on account of the inconstancy of the light. Mr. Vernon Harcourt, however, tested the candles I used, which were the same candles as supplied to Government for their offices, and he found the variation in light considerably less than that of the standard candle. I had, before I made this communication, found a better method of comparison; but, as the paper describing it was unread—being in the hands of the Royal Society—I did not venture to disclose my new method of comparison. I may now mention that the comparisons were effected on the same principle as that just described—viz., using as a comparison light a part of the light which came through the slit of the spectroscope, the part being that reflected from the first surface of the first prism. For taking the illuminating value of the different portions of the solar spectrum this plan has proved invaluable, since any slight temporary haze does not affect the results of the relative brightnesses of the different parts, and therefore the illuminating value of them must have the same ratio to the total light. As the total light varies in exactly the same degree as the spectrum components, the comparison can be rigorously carried out. I may mention that the use of this method has led to some very important results which affect our knowledge of photographic exposures, and I hope, before long, to bring the subject before the Society.

But I have wandered from the discussion of my present apparatus. A very plausible objection might be made that there is no certainty that the bright field on the screen is equally illuminated, and I may at once say that it is not; but this difficulty is got over by a very simple plan. The negative under consideration is moved so that the part required to be measured is brought into the one definite part of the field This is accomplished by a double movement slide—that is, one moving up and down, and from right to left. By this simple arrangement any spot in the negative can be brought into any desired place on the screen. By then equalizing the shadows of the rod thrown by the beams, one passing through the negative, and the other projected from the naked light, the intensity of light coming through any part of a negative can be measured, as it is to be once more remembered that the relative values of the projecting light and comparison light are constant, and the same part of the bright field is always used.

(*To be continued.*)

DEVELOPMENT IN THE FIELD AND A RECORD BOOK.*

BY W. E. PARTRIDGE.

During the past summer I made about eighty exposures, and my experience confirms me in the belief that for successful work there must be occasional development in the field. A gentleman who has just returned from a long trip on the Pacific Coast brought with him some two or three hundred plates, exposed during his journey. The results, a part of which I saw, prove conclusively that he might have saved a portion of his plates had he developed a few during his journey. Another large batch of plates I have just seen developed were exposed in Europe. More than ninety per cent. were failures. A few of these plates developed in the field would have saved a large number of the exposures, perhaps one-half.

After studying carefully over every rational developer that has been suggested, I have worked out the following.

Alkali.

Carbonate of potash	2 ounces
Sulphite of soda	1¼ ,,
Water, to make	7 ,,

Bromide.

Bromide potassium	60 grains
Water, to make	1 ounce

Pyro and sulphite of soda each carried dry. The solution of the latter may be made in a few minutes just before development. A saturated solution, or one nearly so, used at the rate of a quarter ounce for each ounce of developer, will be sufficiently accurate.

An ounce of the developer is made by taking ¼ ounce of sulphite of soda solution, adding pyro according to the plate, exposure, &c., say from 3 to 8 grains, 3 minims of bromide, and making up to one ounce. In this the plate is soaked. Then the potash is added to the extent of from 1 to 30 minims, according to exposure, &c. Usually three or four minims is ample for all exposures greater than the tenth of a second.

The claim I make for it is that it can be put in less bulk than any other which has yet been proposed. It is therefore best for the tourist, who should have his chemicals in the least possible space. A six-ounce bottle will contain sufficient quantity for the development of seven dozen 5 by 8 plates. I prefer to carry the pyro dry, and use the well-known mustard-spoon for getting at the quantity. I use one which holds, as nearly as possible two grains of dry pyro. It has the advantage of keeping better than any of its solutions; for the traveller there is the additional advantage that the dry form does not injure other articles if the bottle gets broken. A good wrapping of paper is an ample protection for it. The other chemicals can be carried dry and mixed when wanted. If the granular sulphite of soda be used, it can be carried in a paper box as easily as hypo. Alum is absolutely necessary for some brands of plates. Chrome alum appears to be most effective, and is most easily carried. A small quantity answers for a large number of plates. Hypo should be carried in a box or in paper, and in either case should be wrapped in a piece of cotton cloth to prevent particles from sifting out. The chemicals, bottles, and pans for developing five or six dozen plates ought not to occupy a space larger than 10 inches wide, 12 inches long, and 2 or 3 inches deep.

An important point in the field is to be able to recognize a plate, and to know at a glance whether a plate has been exposed. A plan I have devised covers the ground more completely than any system I have seen. Every plate receives a consecutive number as it goes into the holder. This number is pasted on to the margin.

I use for the purpose the series of gummed numbers in the early editions of Anthony's little pocket record book. Those in the later editions are too wide. All my holders have slips of white silicate paper pasted upon the wood, and upon this slip the number is written in lead pencil. These latter numbers can be easily erased. As soon as plates and slides are both numbered, and the plate is in place, the number is entered upon a special record book.

The book used for the purpose is a little more than 3 by 5½ inches, and two numbers are placed on each page. When the exposure is made, a lead-pencil line is drawn through the number on the slide, and the usual exposure record made in the book; this record fills less half the space reserved for it. Exposed plates can now be packed away and kept without injury, loss, or danger of double exposure.

When a plate is to be developed, the first thing to be done is to rub the number with vaseline or wax, the latter being preferable; this entirely prevents the number from leaving the plate. It remains attached through the operations of development, fixing, and washing. All the particulars of the development are at once entered against the number of the plate, and, after a print has been taken, a final entry in regard to the character of the negative is made. Development record is made in the dark room, and often while development is going on. This plan of record book combines the exposure and development records, and shows the whole history of the plate at a glance. This I consider one of the most important and valuable features of my scheme.

DEVELOPMENT OF LANTERN SLIDES WITH PYRO.

BY F. C. BEACH.*

Considerable progress has been made in the development of lantern slides lately with the pyro developer, which seems to prove that it is possible to make one developer answer for negatives and positives, and dispense altogether with the necessity of the iron developer.

From a series of experiments I recently made on Carbutt's A plates, I learned that it was only necessary to use a very weak developer to obtain excellent slides of the proper density. I placed the negatives at a distance of 24 inches from a Carbutt lamp, and exposed (the sensitive plate being in contact with the negative in a frame) from 15 to 45 seconds, according to the density of the negative. I developed four plates at a time in one 6½ by 8½ tray, and used the ordinary Beach developer as follows:—

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* Read before the Society of Amateur Photographers of New York

* Read before the Society of Amateur Photographers of New York.

Pyro solution	40 minims
Potash solution	30 ,,
Water	3 ounces

The development proceeds very slowly, which is desirable, and takes about ten to fifteen minutes, and it is advisable to make the blacks much darker than they should be, otherwise they will fix out too flat and thin in the hypo solution. The developer should be used fresh each time. I obtain very clear high lights without the use of any after clearing solution, although I have no doubt it is desirable to employ it. If the developer stands too long, or is used a second or third time, it is liable to give the high lights a very slight yellow tinge. I may say several members of this Society are developing slides with pyro very successfully, and their experience, together with my own, and that which I learn has been tried elsewhere, leads me to the conclusion that it is going to be the simpiest and easiest method for making ladtern slides. If amateurs knew they could use the same negative developer for lantern slides, more of the latter would be made. I do not object to the colour of potash slides; if the exposure is nearly correct it will be a dark brown. It is the sulphite of soda and sulphurous acid in the developer which prevent the pyro from staining the plate, and they thus play a most important part.

If the plate is under-exposed you are not limited as with iron, but can secure a passable slide by the addition of more potash.

Then again the density of the slide is easily regulated; if you wish it to be very thin, suitable for a weak oil lantern, simply decrease by one-half the amount of pyro solution.

If you wish a purple tone, develop with only 10 minims of the pyro solution to 3 ounces of water; and, after fixing and washing thoroughly, slightly intensify with bichloride of mercury and cyanide of silver solution (or Monckhoven's intensifier).

To obtain a brown tone, according to Alvey A. Adee, add three or four drops of the following solution to the developer—

Citrate of soda...	50 grains
Water	1 ounce

and slightly over-expose.

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.*

Chapter II.—The Daguerreotype Process.

Life of Daguerre.—Nicéphore Niepce was a man of a quiet and retiring disposition; a student who was so immersed in his work and so desirous of perfecting it, that he hesitated—while as yet he felt it to be incomplete—to publish even the smallest details with regard to it.

But the man with whom Niepce entered into partnership—Louis Jaques Mandé Daguerre—was of a very opposite temperament, bold and energetic, desirous of fame and its accompanying rewards, accustomed to success and to the applause of the public.

Daguerre was born at Cormeilles, a village near Paris, in 1787. Neglected by his parents, his native talents asserted themselves, and while still young he became known as a scene-painter of great power and originality; while the mechanical effects which he introduced to add to the realism of his stage-views were the admiration of all Paris.

In 1822, Daguerre opened a diorama in Paris, for which he executed paintings on a colossal scale of such scenery as the "Village of Goldau," the "Valley of Sarnen," &c. By painting on both sides of the canvas, and showing the pictures first by reflected, and then by transmitted light, very remarkable changes and effects could be produced.

In the sketches from nature which Daguerre made as a preliminary aid to the execution of these immense pictures, he frequently employed the camera obscura; and it was the remarkable beauty and perfection of the images produced by this instrument that determined the artist to attempt the discovery of some means by which they could be permanently retained.

Without any scientific education or training this task would have seemed to most persons a hopeless one; but perhaps Daguerre's very ignorance of the difficulties to be encountered was the cause of his persevereance. The date of his first attempts appears to have been about 1824; and during the next two or three years we hear of his paying frequent visits to the shop of Chevalier, a well-known optician, of whom Daguerre purchased the camera, lenses, and other articles necessary to his new pursuit.

In 1826, Daguerre was informed—probably by Chevalier—that a gentleman at Chalons had already made considerable progress toward the end which he was himself desiring to attain. Letters addressed to Niépce received, however, but curt responses, and it was not till 1827, when Niépce passed through Paris on his way to England, that he entered into cordial relations with Daguerre. The partnership between these two workers, which was established in 1829, was continued after the death of the elder Niépce; Isidore Niépce taking the place of his father.

Publication of the Daguerreotype Process in 1839.—Year after year passed away and left our scene-painter still toiling after his ideal—ever endeavouring to fix the fleeting images formed by the lens of his camera. His ordinary work is neglected, and he passes nine-tenths of his time in his laboratory. It was at this period that Madame Daguerre sought advice as to the sanity of her husband, and was not, perhaps, much comforted by the assurance of the men of science whom she consulted that the object of her husband's researches was "not absolutely impossible!" Five years after the death of Niepce, his partner was able to announce that he had overcome all difficulties, and that henceforth nature would depict her own likeness with a pencil of light. In 1838, Daguerre attempted to form a company which should acquire and work the new process; but the Parisian public were utterly incredulous, and the shares were not taken up. In this extremity Daguerre showed his specimens, and, in confidence, explained his method to the eminent French astromoner and physicist, Arago. Arago's admiration and delight with this new and wonderful process by which objects were made to draw their own pictures were unbounded. As a man of science, and of world-wide reputation, his endorsement of the value of Daguerre's discovery at once established its worth, and on his recommendation the French Government awarded to Daguerre a life pension of 6,000 francs, and to Isidore Niepce one of 4,000 francs per annum. on the condition that the invention should be published without patenting it, this money being paid by France for "the glory of endowing the world of science and of art with one of the most surprising discoveries that honour their native land." Notwithstanding this official statement, a patent was taken out by Daguerre in one country—England—in 1839.

Daguerre is said to have placed a written account of his process in the hands of Arago, in January 1839, and at the same time to have publicly exhibited specimens of the results which he had up to that time obtained; but no details were revealed, nor was the paper published, until the meeting of the Academy in August of that year. The new process was named Daguerreotype, and the excitable inhabitants of the French metropolis went into ecstacies over it. Nevertheless the Daguerreotype process was, at the time of its publication, very imperfect, and it was destined to undergo important modifications and improvements during the next three or four years.

The news of Daguerre's wonderful discovery soon spread to other countries, and the inventor obtained a rich reward by the sale of apparatus, and by the instruction of hundreds who flocked to Paris to learn the details of the new art. A keen observer—Sir John Robinson—wrote as follows, in 1839, to a friend in the United States: "Circumstances led to my being included in a small party of English gentlemen who were lately invited to visit the studio of M. Daguerre to see the results of his discovery. I satisfied myself that the pictures produced by his process have no resemblance of anything, as far as I know, that has yet been produced in this country. Excepting the absence of colour, they are perfect images as seen by reflection from a highly polished surface. The subjects which I saw were views of streets, boulevards, and buildings; vacillating objects made indistinct pictures. There can be no doubt that when the Daguerreotype process is known to the public it will be immediately applied to numberless useful processes; and even the fine arts will gain, for the eye, accustomed to the accuracy of the Daguerre pictures, will no longer be satisfied with bad drawing, however splendidly it may be coloured." Every word of this prediction has since been fulfilled.

Daguerre died in 1851, aged sixty-three. In 1883, a bust of this ardent worker was unveiled at Cormeilles, funds for its execution having been contributed by photographers of all civilized nations. Viewing his whole career, Daguerre must be considered as a fortunate man. Not only did he reap much honor and material benefit from his discovery, but he lived to see photography rise to an important place amongst the arts and sciences.—*Photographic Times.*

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* Continued from page 36.

Patent Intelligence.

Applications for Letters Patent.

1533. William James Lancaster, 6 Livery Street, Birmingham for "Improvements in photographic cameras, and in a focusser to be used therewith."—1st February, 1887.

1637. George William Elliott, 12, Clarkhouse Road, Sheffield, for "Improvements in dark slides for cameras for photographic purposes."—2nd February, 1887.

1661. George Percival Smith, 7, Calverley Park Gardens, Tunbridge Wells, for "Improvements in camera stands, and the attachment thereto of the camera, horizontally and vertically."—2nd February, 1887.

1681. William Willis, 45, Southampton Buildings, London, for "Improvements relating to photo-chemical printing."—2nd February, 1887.

1902. William de Wiveleslie Abney, South Kensington Museum, for "A mode of lighting pictures, coloured prints, or coloured objects, for the purpose of photographic reproduction."—7th February, 1887.

Specification Published during the Week.

Thwaite, B. H.—"Developing bath for large photographs."

This is advertised in the Official Journal as published during the week ending February 5, but no copy was obtainable as late as the afternoon of the 9th.

2495. Charles Albert Eskell, 2, Onslow Place, S. Kensington, fine art salesman, for "Improvements in tripods for photographic purposes, applicable also to other similar uses."—Dated 20th February, 1886.

A metal tripod with tapering tubular legs.

YELLOW NEGATIVES, AND HOW TO CURE THEM*

We return to this subject, which we have already thoroughly discussed from the one standpoint of the desirability or otherwise of the presence of the well-known "pyro stain," and, having given our opinion, subject to the qualifications named, that it is of undoubtedly objectionable character, our present task will be an exposition of the modes of prevention and cure.

First to be dealt with must, unquestionably, be the addition of sulphite of soda to the developer. It is very singular that the valuable qualities of this salt, so largely used by photographers (though even now there are many who do not employ it), and which owes its introduction entirely to Mr. Herbert Berkeley, of London, was brought under the notice of the photographic fraternity by that gentleman without so much as a single photographer taking up its use; whereupon, twelve months after its first publication by him, he again brought forward its great merits; and very slowly, for a time, did photographers endeavour to profit by his freely-given instructions. Eventually it grew largely into favour, although, as we have said, its use is not by any means universal. To some extent, the cause of this indifference may be set down as the result of a mis-impression, which we may at once endeavour to correct. Sulphite of soda is not added to pyro to preserve it from discolouration when kept in solution for stock; incidentally, it has such an effect to a limited extent; but its true function is to prevent excessive yellowing of the developer, and its ensuing consequences while acting upon the plate. This duty it performs well; a series of negatives may be passed through a developer containing sulphite of soda, and yet leave the solution less discoloured than plain developer minus sulphite would be after a single negative had passed through. If preservation of stock solution were alone the *raison d'etre* of its presence, it might be discarded in favour of a few grains of citric acid, which, at a nominal cost, would do the work far better. But no, its use is, as we say, during the action of the pyro upon the bromide film, and, concurrently with the action we describe, will it be found that the negative also is as little discoloured in proportion as the developer itself.

The prevention of the stains is thus brought about to a considerable extent, though not entirely, for, even when the sulphite is used, the tint given to the film after a prolonged immersion in the developing fluid undeniably partakes of the colour whose presence we deprecate; so that then, as well as when plain pyro is used for the usual length of time, we have to look to a cure.

Before passing on, let us give the proportions in which we use the sulphite. The original formula recommended four ounces of sulphite to one of pyro. Two ounces will answer well; but, as so many occasions arise when an extremely long treatment is given to the plate, our practice has been to use the full four ounces—the substance is inexpensive. We keep the solution ready made, having first dissolved ten grains of critric acid in the water before adding the pyro. If the bottle containing it be fairly well stoppered, the solution can be preserved uncoloured for a lengthened period.

The yellow stain is, as we say, apt to be produced to a modified extent even when the sulphite is used during prolonged development; and as the tendency of our arguments has been to show the desirability of removing every trace of colour, we logically suggest and practically see the advantage of taking out even this slight quantity of colour. The process is simplicity itself, and consists in placing the yellowed negative in a solution of citric acid; but as this treatment would lead to frilling, unless the temperature were very low, it is advisable to add a certain proportion of alum to the acid solution, so as to harden the film. The ordinary alum of the stores, and potash or ammonia alum, will answer; but it is far better to employ chrome alum, an ounce of which is as efficacious as four or more of potash alum. It is evident that the smaller the amount of any salt employed, the less time required for its expulsion from the film; and it must be remembered that it is not advisable to leave any salt whatever in the finished negative; particularly is it to be remembered that every foreign substance of the kind be eliminated before fixing. This point leads us to the question, should the alum and acid treatment be applied before or after fixing? Most photographers employ it at the latter stage, and when negatives are developed out of hand—say in studio work, where the results must be seen at once—this is the only permissible time; for it would be the ruin of any negative to fix it before ample washing after the alum and acid treatment.

When, however, negatives are developed in batches, without any necessity for quick scrutiny of the finished results, there are most cogent reasons why the decolourizing treatment should precede the fixing. In the first case it should be observed that the development of the yellow colour takes place only when the film is in contact with alkaline "pyro" solution, so that the whole of the time that the washing proceeds, and, if the developer be not entirely eliminated, during the fixing also (for that solution has almost always an alkaline reaction), the stain gradually is increased in depth, and there is thus more work to be done afterwards. But, secondly, this is the main point that determines the advantage of acid treatment as a preliminary, while the ultimate effect is, perhaps, the same in either case, the transfer of the plate to the acid bath instantly arrests the action of the developer, and prevents the occurrence of that frequent source of annoyance—increase of density in a negative which had been removed from the developer apparently exactly of the required density. The truth is that even a quick and violent washing of a negative taken out of the pyro solution fails to remove the whole of the developer until after the lapse of several minutes, and all the time the negative is being washed development proceeds at first only slightly arrested, but afterwards gradually at a slower rate. Hence a solution, immersion in which instantly prevents further action when a negative is judged to be finished, is a most valuable aid to uniformity and excellence.

It must, however, be borne in mind that a most thorough washing should be given to the plate before putting it into the hypo bath, and if this be not done, decomposition of the hypo will be brought about, with the result of veiling the shadows and introducing possible sources of fading. But there is neither hardship nor loss of time in this, for the aggregate of time needed will be just the same if the acid bath be employed last, for the plates must be entirely freed from the hypo before placing them in the acid, and must be equally well washed afterwards.

We conclude by giving the proportions that we have found useful for the acid and alum bath :—

Citric acid	... 1 ounce
Chrome alum	... 2 ounces
Water	... 1 gallon

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* Continued from page 7.

Give the plates a slight rinse under the tap when taken from the developer, and place them in this solution, allowing them to remain for about five minutes, and afterwards wash well for half an hour before fixing.

We may say that we have tried the method we have described with many thousands of negatives, and the longer we use it the more do we appreciate its advantages.—*Photographic Times.*

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PHOTOGRAPHIC REPRODUCTION OF COLOURED OBJECTS WITH COLLODION.

BY C. STUEREMBURG.

FIRST PAPER.

But a very short time had elapsed after the discovery of photographic processes, when their advocates, encouraged by surprising and marvellous results, attempted to solve a problem which, if then successful, would have turned photography into channels quite different from those of the present day.

Efforts were made in the earliest times to reproduce natural colours. It was soon observed how insufficient was our knowledge in the sciences of physics and chemistry to aid in attaining or solving a problem, promising results of irreproachable beauty, but laying before the experimentalist a train of unsurmountable difficulties. Proofs had repeatedly been given to show the possibility of copying natural colours, but the impossibility of fixing them permanently upon plate or surface took all practical value from propounded theories and facts, so that a development of the problem was tacitly left to future times.

Consequent to the failures of obtaining the results aimed at, attempts were made to photographically reproduce highly-coloured objects in such tones as to represent brighter or darker shades in correspondence with those of the original. To do this, the methods adopted in portraiture were first resorted to, methods which by the newly-discovered collodion process had in comparison with the Daguerreotype, and the ability to produce unlimited numbers of copies from one plate, gained enormous popularity.

It was, however, soon discovered that the various colours did not photograph correctly upon the collodion plate; blue and violet acted proportionally with great force, and were reproduced with greater brightness than green, yellow, orange, and the different shades of red, which came far too dark. A longer exposure remedied the evil to some extent, but at the same time the more active colours appeared with greater force, and the general effect of the reproduction was therefore not improved. A limited time of exposure could only preserve fine modulations and details in some colours.

The want of uniformity in the photo-chemic action of colours was the more observed in the reproduction of works of art, especially in landscapes in oil. With extensive improvements made in the collodion process, the ability to copy oil paintings with more correctness steadily progressed, and individuals and photographic firms developed peculiar methods to serve their own purposes, but they remained their property, and were never made public. Retouching the negatives helped in a mechanical way to equalize colour effects upon the finished picture.

Highly important discoveries were recently made by which aid is rendered in the correct translation of colour values. The experiments which are being made in that direction, but which by no means can be considered as concluded, have awakened in all photographic circles enormous interest in the correct reproductions of colour values. It had been observed that certain colours, as yellow, orange, and red, come much better upon the photographic plate when they were copied by interposing coloured glass screens between objective and sensitive plates, and as such screens of perfectly pure colour are but difficult to obtain, it was proposed to substitute them by giving the desired colour direct to the sensitive film. The idea proved to be correct, and various experiments made tended to adopt for the purpose several dye stuffs like those belonging to the eosine series and the chinolines.

The methods for employing these dyes have been termed iso- or ortho-chromatic, meaning that with them, the less actinic colours act upon the sensitive plate with a force equal to that of blue or violet, without disturbing the general harmony of colour effects. Of the many modifications these processes have been subjected to, stands pre-eminently the addition of chemical combinations of the dye and a silver salt to the ready-prepared gelatine emulsion, or that of a light-sensitive silver haloid like fluoride of silver, of which, in earlier times, Van Monckhoven had made mention, as being in itself sensitive to non-actinic rays. Dyes naturally reduce the general light sensitiveness of a photographic plate, and require their exposures more than three times those of the mother emulsion; not very important in the case of reproductions, which eventually can be made in sunlight, but a great obstacle when photographing in the light of a portrait atelier.

But let us now ask in what consists the practical value of those methods? There is scarcely any doubt but that certain advantages will result from them as soon as they have thoroughly passed the state of experimenting with them. At present it is impossible to say if they ever will or can displace the collodion process in the reproduction of colours in their true character of brightness.

With the exception of a few quite abnormal cases, proof has not been given that isochromatic methods can supplant the collodion process, provided that with regard of the subject to be photographed, the collodion plate has been prepared with proper modification. Difference in the results with the two modes of working is seen to be enormous in particular instances, as in the reproduction of aquarelles. When comparing these results with each other, and before deciding in favour of the one or the other, justice demands us to take notice whether the preparation of the collodion plate has been done with certain absolutely necessary alterations, or whether the plate has been the same as that used in portraiture.

When, with long-continued exposures of wet plates, the resulting negatives are feeble and befogged in all the deeper shadows, it may be safe to say the process has not been modified. Fogging occurs only with long exposures, when the silver bath is faulty. The non-action of the warmer tones is due to a want of bromides in the collodion, and a totally erroneous manner of operating.—*Photographic Times.*

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AMATEUR ENLARGING ON A SMALL SCALE.

BY J. TRAILL TAYLOR.*

The problem of a simple and easy mode of enlarging for amateurs, as regards the lighting department of the operation, is still open to receive more attention.

I am the fortunate possessor of several oil lamps, whose fine Greek names do not sufficiently counterbalance the trouble in trimming the wicks (which in some instances are many), the great heat, and the unpleasant smell. Could an enlarging lantern be lighted with common gas, then, indeed, would all troubles cease, but carburetted hydrogen gas as supplied from the Company's mains is frequently deficient in illuminating qualities in a lamentable degree.

It is, however, well known to all of us that house gas may have its luminousness greatly intensified by mixing with it the vapour of some one or other of the numerous hydrocarbons. This subject has been brought before the world at various intervals during thirty years or more, and a greater or less degree of success has attended individual instances of the application. It is this system of illumination which I have thought might fittingly be impressed into the service of the photographer who, without having the mess with charred wicks and oil every time he wishes a light, might desire his appliances reduced to a gas burner, and the whole preparation reduced to connecting a rubber pipe with the nearest gas bracket.

Of the various systems employed for more thoroughly carburetting gas, that which I bring before your notice is one of the Albo-carbon *genus.* I purchased it at one of our London shops for 8s. 6d., and having had it in use for some time can speak of it very favourably. Its principle consists in a piece of metal being placed above the gas flame, and which, thus becoming heated, conducts the heat to a chamber behind, which contains a hydrocarbon that vaporises at a temperature of 150 or more.

The arrangement is such that either the gas in its primitive state, or after it has been enriched to saturation, may be emitted at the jet, and, without having had recourse to photometry to determine the advantage, it appears to me that the intensity of the light is increased fourfold.

But in order still further to obtain the highest advantage offered by the system, I have had this modified burner constructed, in which two flames are employed, one being about an inch behind the other, with an air-space between. This is essential to success in obtaining the best effect.

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* Read at the Photographic Conference.

[The speaker then exhibited and explained the construction of the gas burner to which reference had been made. By means of a socket which had a thread similar to an ordinary gas burner, this one could be lifted in or out of the enlarging lantern immediately, and by previously warming the reservoir, so as to initiate the vaporisation of the "Albo-carbon" inside the light, assumed its energy in half a minute after being ignited. He spoke of the disadvantage of dimensions in the flames; magnitude, he said, was not compatible with the highest definition. Hence, having first secured the required brilliance, he interposed a screen or diaphragm between the lantern condensers and the flame, and as close as possible to the latter. The aperture in the diaphragm was circular, and it varied from half an inch to an inch in diameter, the smaller one giving greater sharpness to the enlargement than the other. The position of the diaphragm was such as to hide all the light save a very bright portion selected from the most luminous part of the flame. He found it also advantageous to insert immediately in front of the diaphragm a small plano-convex lens, which prevented some loss of light by concentrating it upon the lantern condensers, at the same time that it permitted the light to be brought a little closer to them. He showed on the blackboard by what means this system could be applied to the enlarging of negatives of larger dimensions than it was possible to utilise for this purpose by the condensers of his lantern. With the larger diaphragm, the burner shown was quite applicable for projecting pictures on a screen sufficiently well lighted for a parlour lantern entertainment.]

Correspondence.

A REMONSTRANCE.

Sir,—There are two printer's errors in the letter you have done me the favour of publishing in your last issue. In the second par., for "gradation" read *production*, and in the ninth par, for "our" read *your*.

I am pleased to see that the "change" I predicted has already commenced "to come o'er" your spirit, and that your present views (at least as regards platinotype) seem to tally with my own. But how you could have ever imagined that the image was attacked, which even Mr. Pringle's writings did not attempt to show—at least, not those to which you alluded, describing the experiments—I am at a loss to comprehend.

There is every reason to suppose that the lightening of the yellowish paper by exposure of the print to light is, as you say, due to oxidation of iron sulphide into sulphate. I have touched upon this previously in a letter to *British Journal of Photography*, with the publication of which I have not yet been favoured.

It is possible that I may not be permitted to go further into the matter, and to explain the quasi-chemical fallacies. However, the editors have had in their hands some little time explanatious from me; and I also call upon Mr. Pringle to state his authority for the assertion—now repeated as a doubt—that the image of platinotype is not metallic platinum.

I am confident that I can reply in a manner which no one can dispute—at least disprove—to any objection as regards the complete stability (stability equal to that of the holding qualities of the paper) of the platinotype print, as I shall direct it to be produced; and I can also dispose of all the quasi-chemical absurdities which are being bandied about.

I am almost forgetting to state plainly that the "yellowing," though curable by treatment with fresh chlorine water in the dark, as both you and I have pointed out, in a properly-produced platinotype is not possible.

Of course a pretty good tale may be made by a similar plea regarding the "whites" of albumenized prints; but the difference in the cases lies here. In the latter instance no one can say how the unchangeable character, if there be such a thing, is to be secured; neither can any secure even fair lasting qualities with any certainty. In the case of platinotype I claim that I can point out the way to secure unchanging prints, in the sense of engravings, and that such prints can be guaranteed to be as "absolutely permanent" as any print upon paper known.

If anyone chooses to give me a nut to crack, I shall be happy to dispose of it. I am afraid writing upon these general and vague statements will never be entirely satisfactory. Let any make specified charges, and challenge me, and I will reply categorically. Let there also be some kind of definition of what "permanency" is to be taken to mean, so that after a long argument I may not be told that in the view of my antagonist the albumenised silver process is a fair example of the term in question! This is no dream; I have experienced it in the pages of your contemporary! With thanks for your recent testimony,—I am, sir, yours faithfully, Herbert B. Berkeley.

PHOTO-ENGRAVINGS.

Sir,—The paragraph on page 10 of your issue of January the 7th, which states that "photogravures are rarely seen in the United States owing to the prohibitive price" caused by the duty of 30 per cent., is, happily, not true. Photogravures are as common here as fine weather is scarce in London. The prices may be higher than with you, from $1 to $15, or $18 for larger sizes; but that does not prevent their ready sale. In fact, the art stores here are as well supplied with the latest etchings, engravings, and photographic reproductions generally as any, probably, in London; and the same no doubt is true of all the large cities in the Union.—Yours truly, E. H. Derham.

Proceedings of Societies.

Photographic Society of Great Britain.

The annual meeting was held on Tuesday evening, Feb. 8, at the Gallery, 5a, Pall Mall East, James Glaisher, F.R.S., President, in the chair.

The minutes of the previous meeting having been read and confirmed, C. Wray, Palliser, and the Rev. C. H. Sutton, were elected members of the Society.

W. F. Donkin (Hon. Sec.) then read his report, in which the past year's work of the Society was duly set forth. An analysis of the Exhibition showed that of 198 contributors represented, 97 were amateurs, and 101 professionals. The number of members, both amateur and professional, who sent pictures was 105, the remaining 93 being foreign exhibitors and non-members. Landscape, genre, and portrait studies largely predominated; but of such which possess strictly scientific interest and astronomical value there was an absence. There were some examples of photomicrography, photogravure, and mechanical printing processes, and several photographic reproductions from oil-paintings taken on orthochromatic plates, which illustrated the great value of this process. The election of 54 new members showed the Society was steadily increasing numerically, while its work was that of progress in the advancement of photography.

W. S. Bird (hon. treasurer), next read his report and financial statement, which, he said, bore evidence that the Society's funds were £22 11s. 11d. ahead of the previous year. There were 406 members, and the subscriptions amounted to £16 over those of the year before, but he thought, with the President, that they should have at least 500 members, besides the 60 life members, to carry on the work as they would wish. Then it might be practicable to have a home of their own where covenants and stringent rules the Society was now under would not exist. He (Mr. Bird) should be glad to see some measure devised for reducing the cost of the Society's Journal. Last year he offered a suggestion that it should be published in two parts—namely, in the middle and at the end of the session, and the number of illustrations be reduced. Now this year the charge for illustrating had been higher than last, with one illustration less. This was accounted for by the extra cost involved in producing one subject in platinotype. Speaking of the exhibition, he said that admittances realised £297, an increase of £47 over the previous year, and it would be observed that this item came entirely from the outside public, members and their friends being admitted free. He thought the display was a very pretty one, not an inch of space wasted, and many frames had to be sent away for want of room. As regards the selection of judges he thought the Society would do well to revert to their old plan of electing artist painters on the jury. From careful inquiries made, it appeared that the injury to exhibitors' frames which had formed a subject of complaint, was chiefly due to projecting nails and inner frames. If exhibitors would insist on having flush backs to their frames, it would help considerably towards preventing damage to their own as well as to other exhibitors' frames.

Formal votes of thanks were then accorded to the Hon. Sec. and Treasurer for their services, the auditors, F. Cobb and F. Ince; also Capt. Abney for editing the Society's Journal.

The result of the election of officers for the ensuing year, to fill the vacancies of those retiring, was announced as follows :—

President—James Glaisher, F.R.S.

Vice-President—H. P. Robinson.

Treasurer—Walter S. Bird.

Members of Council—C. E. Abney, T. Bolas, W. K. Burton, Francis Cobb, W. F. Donkin, J. Traill Taylor, Col. H. Stuart Wortley.

The scrutineers, G. L. Addenbrooke, W. M. Ashman, and G. G. Scamell, having been thanked for their services,

T. Sebastian Davis proposed a vote of thanks to the President for his assiduous labours on behalf of the Society during the past and many former years. This was seconded by W. England, and passed by acclamation.

In returning thanks, the **Chairman** alluded to the desirability of regular attendance by members of the Council. He made a note of the dates at the beginning of the year, and reserved himself especially for the Society's work when the meetings came round. He did not consider anyone should take a position on the Council unless they could attend every meeting, as an absence on one occasion caused a loss of touch in the general business.

J. B. Spurge then read a paper entitled "A Method of Estimating Photographic Deposits with Reference to the Printing Qualities of Negatives." He (J. B Spurge) having referred to the want of a reliable method of determining densities in gelatine negatives, said he had been led to make some experiments with the sensitometer introduced by Mucklow and himself in 1881. Many present would remember that a light of known intensity was made to pass through a series of holes in the instrument, each possessing different areas, and a gelatine plate was placed behind; development and fixing followed. He then described his method of ascertaining initial density, as, for instance, a film of clear gelatine on glass, illustrating the same by means of black-board and chart, and the manner of ascertaining any degree of density up to the limit, a maximum of seventeen gradations. A series of seven plates which had been exposed under the sensitometer, developed, fixed, and stained with different substances, were then handed round, together with silver prints from the same; and from his experiments calculations had been deduced which he believed accurate. A figure in white blouse in front of a tarred fence had been chosen for the limits of gradation, and the ratio between these was 1 : 200 At the conclusion a vote of thanks was accorded.

The **Chairanm** thought it better that the discussion should be taken after the paper had been published; this being assented to, he adjourned the meeting until Tuesday, March 8th.

The next technical meeting will take place on Tuesday, the 22nd inst.

Photographers' Benevolent Association.

The Committee met on the 2nd inst., when L. Blake, A. C. Edwards, B. J. Edwards, Friese Greene, T. J. Dixon, G. A. Garrett, W. England, J. D. England, Wm. Bedford, H. Bedford, Lemere, G. P. Cartland, F. Wilson, T. Edwards, L. Bourquin, W. J. Basket, J. Rice, G. Carroll, W. Jones, W. A. Welford, R. J. Dubbin, W. Young, and Dutton, were enrolled as members.

It was decided that the Annual General Meeting should be held on 21st inst., at 181, Aldersgate Street, when it is hoped the members will endeavour to introduce new members.

North Surrey Photographic Society.

The usual fortnightly meeting was held at the Greyhound Hotel, Dulwich, on February 2, Mr. **Larcombe** in the chair.

W. W. Walker introduced for discussion "The Properties of Chloride of Silver, and its Adaptability for Photographic Printing." After mentioning the various chloride of silver papers at present in use, Mr. Walker described their method of manufacture, and referred to the more recent introduction of collodio-chloride papers, pointing out the advantages of finding some suitable substitute for albumen as a coating for silver paper.

An animated discussion followed, in which most of the members joined.

It was decided to devote the next meeting on February 16 to an exhibition of lantern slides made by the members, and a discussion on the methods of making lantern transparencies.

Manchester Photographic Society.

The second popular meeting of the session was held in the large lecture hall of the Athenæum on January 27, W. I. **Chadwick** in the chair.

Views were contributed by the following publishers :—Messrs. Gale, Brooks, Wilson, Fincham, Valentine, York; also by the following members of the Society :—Messrs. Greatorex, Coote, Burt, Muth, and Whittaker; in all, 350 slides. The views were briefly described by Mr. Chadwick. A large number of the views were of a very choice description both in composition and manipulation, and well deserved the hearty applause they received from a large audience numbering about 700. J. G. Jones was the lanternist.

Sheffield Photographic Society.

The ordinary monthly meeting was held on February 1st, at the Freemasons' Hall, T. S. **Yeomans** in the chair. A lantern slide competition took place, prizes being offered for the best series of six slides made by any photographic process. Eight members contributed, and the slides included specimens of the gelatino-bromide chloride and wet collodion methods. The first prize was awarded to T. Y. Hibbard, and the second to R. Y. Shields. Mr. Preston exhibited an electric lamp suitable for dark room purposes, also a number of Woodbury slides.

Society of Amateur Photographers of New York.

A meeting was held on January 11, F. C. **Beach** (president) in the chair.

The **President**—I expected to have a special new camera here this evening, but was disappointed. In place of it I have an improved Hoover shutter, which may be of some interest to you, and I will briefly describe its special points. This tube which holds the shutter [indicating] is one which I had made to correspond to the regular Ross tube, and then the lenses are taken out of the original Ross tube and put in this. One of the important advantages this shutter has over a great many others is, that you dispense entirely with all loose diaphragms. The shutter itself is a diaphragm, and as you regulate it by moving a small lever from one side to the other, you regulate the size of the aperture where the diaphragm is. You can with this shutter make an exposure instantaneously, at any degree of opening that you may wish, and you can make a time exposure very easily. Now, perhaps if I hold the shutter up to the light here you will be able to see it better, and observe the movement of it more particularly. [Holding it up before the light.] You see the shutter remains open as long as I squeeze the pneumatic bulb. You will notice there is a separate device rigidly attached to the bottom edge of the shutter case, having a small pipe at the bottom, over which the rubber pipe slides. Above this is an expanding air valve made of rubber, dam rubber such as dentists' use, clamped between two circular rings of gutta-percha. As the pneumatic bulb is compressed, the pulsation expands the rubber dam valve, rapidly inflating and raising it. As it rises it presses against a disk attached to the bottom of a delicate vertical slide operating the latter, which in turn strikes against a projecting pin attached to the joint of the shutter, causing the latter to open. As the pressure on the bulb is released, the rubber valve collapes, allowing the slide to fall by gravity, and also the shutter to fly back. The movement of the shutter is controlled by a coiled flat spiral spring. As long as you compress the bulb the shutter will remain open; when released it will instantly close, or by releasing the pressure gradually it can be made to close very slowly. I will set it at medium opening, say *f*-16, and operate it. Now the last opening is *f*-64. The size of the apertures in the respective diaphragms are all based on the principle of division of the equivalent focus. The way that the shutter operates is that there are two shutters which slide in opposite directions until the half of the aperture in each coincide, they then stop and fly back again. It is what is termed the go-and-return movement. Now, for the instantaneous exposure we have a special metal pneumatic piston here on the end ; we remove the rubber pipes from the time-bulb movement, and attach it to this piston. Pressure on the bulb forces the piston out against a pivoted lever, which in turn operates the release and lets off the shutter. To make the shutter go fast you simply rotate the little milled head, having a little toothed disc attached in which a gravity pawl engages. As you rotate the milled head and wind the spring, the pawl catches in the toothed disc every time, and holds the tension of the spring. To put on the tension you first set the shutter and then wind the spring up. This is supposed to be about the highest speed [illustrating]. You see the shutter is entirely balanced, and you can set off by touching the release with your finger just as well as you can to work it with the pneumatic bulb, so that you are independent so far as that is concerned. These are the three principal advantages of the shutter : that it has a diaphragm and shutter combined in one ; that you can make a time movement by pressing the bulb valve below here ; and also have an instantaneous attachment for a pneumatic release, also that you can quickly change from a small stop to a full opening, and from a full opening to a small stop. A special gravity pawl is provided for holding the vertical slide up to keep the shutter open for focussing or for using the ordinary cap.

Manchester Amateur Photographic Society.

The ordinary monthly meeting was held on Tuesday last, the Rev. H. J. Palmer in the chair.

Messrs. Bartleman, Duncan, Hudson, Macnamara, Nowell, Ogden, Overstall, and Rowley were elected members.

The President exhibited several 24 by 18 enlargements on Eastman's bromide paper, and stated that he had fitted his room up for enlarging with this paper.

Talk in the Studio.

London and Provincial Photographic Association.—At the meeting held on Thursday, the 3rd inst., A. Cowan in the chair, F. W. Edwards demonstrated the usual method of developing commercial platinotype paper ; and W. Willis (the patentee) described the mode of preparation, also the reactions which are supposed to occur. In the course of his remarks he pointed to the possible formation of organic compounds with gelatine as likely to cause discolouration. On Thursday next a demonstration will be given by J. Hubert on the toning of collodio-chloride prints, and the application of the process to the making of lantern transparencies and the reproduction of negatives.

The Photographic Exhibition at Florence.—This exhibition, concerning which particulars will be found on page 497 of our last volume, will be opened during May next, and will close on the thirteenth of June. The form of application for space can be had from the president N. Nobili, 33, Via Street, Gallo, Florence, Italy ; and all applications from Europe must be in the hands of the Committee by the 15th of March next. Applications from America will be received up to March 30th.

Isochromatic Photography by W. H. Hyslop.—This communication stands over till next week.

The Exhibition at Theale.—With regard to this matter we have received a somewhat strange letter from the Secretary, who commences by assuming that our remarks were based simply on the perusal of the catalogue. He does not deny that apparatus and materials were on sale for immediate delivery, and yet appears to wish to convey the contrary impression ; and he seems to forget that the monetary success or failure of an undertaking is not the real criterion by which to determine whether it is commercial or not ; neither does he see that a commercialist photographer is still a commercialist, even if he order his business so badly that he is out of pocket by it. He writes :—"Sir,—Your criticism on the Theale Exhibition, which you admit is made simply on the perusal of a catalogue, is hardly a fair one. It is by no means an unusual thing at photographic exhibitions to price pictures and apparatus in the catalogue, and we adopted this plan subject to the goods, if sold, not being removed until the exhibition was over. With regard to the packets of Woodbury tissue, Autotype tissue, quick printing paper, and other small matters, they were simply put up in packets by the vendors, so as to enable amateurs to give the processes a trial. So far as the promoters of the Exhibition were concerned, no profit will be made on the sale stalls, for the cost of attendants, &c., will much more than dispose of the ten per cent. allowed on a few 1s. or 2s. 6d. articles. The actinometers and squeegees followed, as a matter of course, the sale of packets of carbon tissue. I must leave Mr. Wilder to fight his own battle with you as to whether he is, or is not, allowed, as an amateur, to price his work. That he does not get his living by photography, but, on the contrary, like some of the rest of us, finds it a rather expensive hobby, I can safely answer for, and therefore, until an amateur is more clearly defined, we were quite justified in giving him the asterisk. If you had described the pictures, or even mentioned that we gave the people lantern exhibitions with lectures on the various countries and objects shown, or provided them with microscopes and attendants to explain the various slides, it would have been some return for the trouble taken. However, in spite of its many failings and shortcomings, the Exhibition has answered the purpose for which it was promoted, viz., it has drawn together the local amateurs and professionals, and it has afforded our people here a week's rational and instructive amusement ; but so far from its being a shop out of which profit was made, I fear I shall have to provide a balance to cover costs.—Yours truly, Alfred Harrison, Hon. Sec."

Photographic Club.—On February 16th, the adjourned discussion on the "Art Treatment of Photography," demonstrated by Mr. Norman Macbeth, R.S.A., will take place.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C. ;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Essex.—A mere waterproof coating will not answer as a protection against damp in this case, but you can use india-rubber solution as a mounting material. Spread a thin layer of the thick solution on mount and print, and when the surfaces are so dry as to be tacky, place the print in position, and establish contact by pressure. When all is thoroughly dry the superfluous rubber may be removed from the margin by friction with a piece of india-rubber.

Geo. H. Rutter.—1. Probably you can obtain it from Butler and M'Culloch, of Covent Garden, London. 2. As regards this point we have no information.

L. R.—The carbon process is perhaps the best for the purpose. Obtain the Autotype Manual, published at 74, New Oxford Street, London.

Amateur.—Brown tissue paper is the article referred to.

Cambrian.—As far as our experience goes, they are of precisely the same excellence when stopped down to the same degree, excepting that the latter will include a somewhat wider angle than the former.

G. W. H.—Articles have appeared from time to time, but you will find all you want in Lang's papers on Stannotype, which commenced on page 789 of our volume for 1886.

N. M.—It shall be forwarded.

E. Pepper.—It is, we believe, a mere mistake to suppose that this time is required. It works very satisfactorily if freshly prepared.

F. Floyd.—In the Year-Book for 1887 you will find full directions for this class of work.

Marion and Co.—Thank you for sending it on to us.

H. Meller.—In this country no one sells it, as far as we know ; but it can be had from E. Liesegang, of Düsseldorf, Germany. The above address is enough ; write for list of materials.

Geo. Logg.—You do not say for what purpose you require the instrument ; but if, on referring to our article on carbon printing (page 82), you do not find the information you require, write again, giving fuller particulars.

C. B.—1. When the material is quite dry, considerable pressure is required, and it is very probable that the springs of your printing frames are not sufficiently strong. 2. Soak it in methylated spirits.

A. P.—It will give us much pleasure to do as you suggest.

Thos. H. C.—1. It is in the Year-Book for 1884, page 64. 2. It is a matter altogether beyond our province ; still, we agree with you.

V. T. Morgan.—It is quite a reasonable view to take, and it seems to us likely that a majority of the members will agree with you.

J. A. King.—Your letter gives no additional facts, and in no way bears upon the actual statements made ; but if you can let us have some addititional information, we shall be glad.

W. T.—Cowan's answers the purpose very well.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1485.—*February* 18, 1887.

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THE COLOURED SCREEN IN ISOCHROMATIC PHOTOGRAPHY.

USE OF SULPHATE OF QUININE SOLUTION AS A SCREEN.

The value of the yellow screen as a means towards isochromatic photography was pointed out in a leading article which appeared in the PHOTOGRAPHIC NEWS more than twenty-eight years ago* ; and, in spite of all that has since been done in the direction of staining the film, it is a question whether the coloured screen is not by far the more important element of the two in isochromatic photography.

It but little concerns us to enquire how many have claimed the introduction of the coloured screen since the article just referred to was written ; but it is only fair to say that, at the time referred to, the PHOTOGRAPHIC NEWS was under the editorship of William Crookes, and it may be assumed that he is the author. We cannot do better than to quote the last paragraph of the article :—

> By employing the information above given, it will be possible to obtain far more correct copies of paintings than are usually to be met with. The collodion should not be iodised, but *bromised*, with four grains of bromide of cadmium to an ounce of plain collodion ; and the lens, which must have a sheet of yellow glass close in front of it, should be a portrait combination, working with the full aperture, as the time of exposure to the feeble rays, which alone can filter through the yellow glass, will be enormously prolonged, even when the picture is illuminated as perfectly as possible. The plate should be slightly *over*-exposed, so as to diminish still further the unadvoidable exaggeration of the lighter parts of the painting, and, at the same time, bring out the detail in the dark parts. We are of opinion, that better results may be obtained by increasing the number of thicknesses of yellow glass in front of the lens. An experiment of our own will show how far this modifies the usual photographic action :—A strip of card was painted with several brilliant colours, and then a photograph was taken of it, with iodised collodion, in the ordinary way. It came out, as might be expected, with the photographic order of intensity totally unlike the *visible* gradation of intensity. Bromised collodion was now used, and the result was much better ; one thickness of yellow glass was then interposed, and the effect, whilst it increased the time of exposure from seconds to minutes, gave a very marked improvement in the truthfulness of the picture. A second piece of yellow glass was afterwards used, which had the effect of still further increasing the resemblance to the light and-shade effect of the original colours ; and thus we went on, at each addition of yellow glass obtaining a slightly truer translation of the colours into light and shade, but at an enormous sacrifice of time, until, at last, the plate would not bear the necessary exposure ; and, at five thicknesses, we were obliged to desist. At this stage, the photographic effect of the different colours was much nearer their true effect on the retina than if they had been copied in the ordinary way ; but they were still very far from giving the tones which an engraving of the same subject would have presented. The too energetic action of the blue colour was entirely overcome, but the red and yellow still offered difficulties which, we fear, no amount of obstruction would ever have properly overcome. The subject, however, is one which, from its importance, deserves more, far more attention, than has yet been paid to it ; and we have dwelt thus long upon it, in the hopes that we may induce some experiment-loving amateur to take the subject up *con amore*, and assist further in elucidating this most difficult application of the science of photography.

One point insisted upon is the superority of bromide over iodide, and in another part of the article it is pointed out that a layer of solution of sulphate of quinine between parallel glass plates cuts off all the light above the indigo, but that its action is not so powerful as that of the yellow screen. In conjunction, however, with a stained plate, the quinine screen is very satisfactory in its action.

The whole of the article from which the above quotation is made is well worth reading, and those of our readers who possess our first volume should turn back to it.

A lens so constructed that the space between two of its glasses could be filled with a liquid would probably be very convenient for the practice of isochromatic photography—in fact, something made on the principle of the water lens of Archer.

◆

DAVENPORT'S SLIDE CARRIER FOR THE OPTICAL LANTERN.

AMONG the many ingenious contrivances which have been recently introduced for facilitating the exhibition of transparencies in the optical lantern, where a single lantern only is employed, one deserving of attention from its simplicity and effectiveness is a combination slide-changer and curtain which has been lately designed by G. Davenport, of the Society of Arts. A description and illustration of this apparatus is given on the next page.

The object sought to be attained in nearly all the modern slide-carriers has been to make the change from one slide to another as rapid as possible, and at the same time to avoid the appearance on the screen of a simply illuminated disc.

The simplest form of apparatus for this purpose is probably the ordinary panoramic carrier. But this plan has what is considered by many the disadvantage of showing on the screen the movement of the slides during the changing of the pictures.

In the biunial lantern the difficulty is partially obviated by the methods of dissolving usually employed. The confused effect, however, of the superposition of the two pictures on the screen is more or less fatiguing to the eye, and a system in which the light is shut off entirely during the changing of the slides is more often preferred, as it allows momentary rest to the eye, and so causes the picture which follows to appear brighter than would otherwise be the case.

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* Vol. i., page 61.

This is very successfully accomplished with a single lantern by Davenport's slide-changer.

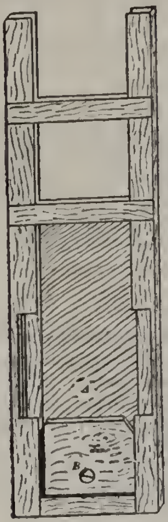


Fig. 1.

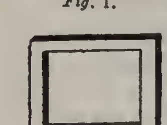


Fig. 2.

The frame of the apparatus, fig. 1, consists of two uprights of wood kept in position by cross-pieces. Each of these uprights has two grooves on its inner side, a wide groove and a narrow in the wider grooves, the carriers (fig. 1) containing the slides work. In the narrow grooves is a thin metal screen or "curtain" (A, fig. 1), to the lower part of which is fixed a sliding block B, having a vertical action by which the screen is raised or lowered as required.

The carrier containing the slide, being placed in its grooves by an opening in the lower part of the frame, is raised by means of the sliding block till it occupies the usual space in front of the condensing lens of the lantern. It is retained in this position by spring catches attached to the sides of the grooves.

When a slide is to be changed, a second carrier, with its slide, is placed in the frame, and raised by the sliding block as before described. In rising, this carrier pushes up the one already in front of the condenser, and takes its place.

Sufficient "lead" is allowed to the metal screen to enable it when raised by the sliding block to cover the space in front of the condenser, and obscure the light during the changing of the slides.

The effect produced on the screen is that of a falling curtain, which, on being raised, discloses a fresh view to the audience. The operation is smooth and automatic in action, and can be worked very rapidly if desired.

The slide-changer is intended for use in a vertical position, but where, from the construction of the lantern, this cannot be arranged, the apparatus, by the addition of a small catch, can be employed in the ordinary horizontal stage of the lantern front.

Messrs. Newton, of Fleet Street, are supplying the apparatus, but no patent rights cover its manufacture.

NOTES ON PHOTOGRAPHY IN GERMANY.

BY W. E. WOODBURY.

Transferring Chloride of Silver Collodion Pictures to Glass, etc.—New Instantaneous Photographs—Fine Art Exhibition at Vienna—Preliminary Hypo Bath for Negatives.

Liesegang's Method of Transferring Collodion Pictures.—According to an old method, a sheet of paper was coated with a thick film of soluble gelatine; when dry, it was again coated with the sensitive collodion emulsion. To remove the collodion film, it was merely necessary to wash the back of the print with warm water till the gelatine was dissolved, and the paper released itself from the support. This method, however, was often attended with no little inconvenience; the gelatine sometimes became insoluble through age, and caused much trouble before it was loosened. Dr. Liesegang employs a thickly gummed paper instead of the gelatine. The paper is gummed over in the ordinary way three or four times, and, when dry, it is stretched out on the frames employed for coating with collodion, and already described in my article in the Photographic News on Collodio-Chloride as a Substitute for the Albumen Process, in which the recipe for the manufacture of the collodion will also be found. When dry, the paper is coated in the ordinary way. The collodion should, however, be allowed to remain a few seconds on the surface before being poured off, in order to obtain a thick layer, which is very essential, especially when required for transparencies. The collodion paper is then exposed in the copying frame under the negative until the lights show a blue tinting, but the shadows are deep black. Unless a reversed negative has been made use of, the transferred print will of course be reversed; the double transfer process must be resorted to. For lantern slides or window transparencies, the single transfer process is generally used, it being the simplest. The glass, ivory, or porcelain plate to which the picture is to be transferred, is then coated with a 10 per cent. solution of gelatine and allowed to dry. This plate, together with the strongly-printed picture, are immersed together in cold water. Lay the picture upon the plate, and after taking both out of the water together, go well over the print with an india-rubber squeezee. After a short time it will be found possible to draw away the paper, leaving the picture adhering to the gelatinised support. The picture is then immersed in a solution of hyposulphite of soda, thoroughly washed, and allowed to dry. The double transfer method is as follows. A transfer paper is required. This is made by soaking smooth glued paper in ethereal copal varnish. This paper is dipped in cold water together with the picture. Both are drawn out and laid upon a somewhat larger glass plate. Go over with the squeezee in the manner already described, and draw the gum-paper away. The whole is then fixed and washed. After removal from the last washing water the picture is laid upon the final support previously coated with gelatine, again squeezeed, and the transfer paper drawn away. To make copies of a negative, a diapositive is first made according to the first method, and from this a negative according to the second method is prepared. By this process the negative copy will have just as powerful and sharp an appearance as the original.

Instantaneous Photographs by Anschutz.—I very recently had the pleasure of seeing some of Ottomar Anschutz's latest instantaneous pictures. Herr Anschutz has recently increased his collection of more than 1,300 instantaneous pictures by many new ones. Instantaneous photos of wild boars, wolves, foxes, pigeons, storks, cats, dogs, horses, monkeys, and men will be found among this interesting and instructive collection. These pictures are reproduced by the collotype process, and the whole is sold for ten shillings. This low price has, it has been stated, been fixed by Herr Anschutz in order to awaken the interest of the general public to so important and useful a study. Many German artists are availing themselves of these instantaneous studies. In series of pictures published by this same photographer, it is quite astonishing to note how many different movements are summed up in the one execution of a leap which to the unaided human eye seems only a single effort. It is also worthy of note what a perfection of muscular movement appears in the shortest possible time.

International Annual Exhibition of Graphical Arts in Vienna.—The Society for the Cultivation of the Arts has just opened the first annual exhibition of prints, engravings, &c., at the Vienna Academy, in which a department is specially allotted to reproductions by technically chemical processes. Next to copper-plate engraving, etching, lithography and wood engraving, zincography, lichtdruck, (collotype), heliography, and photo-lithography occupy a very considerable space in the exhibition, showing the astonishing progress that has been made during the past few years in these methods of reproduction by the aid of that great auxiliary, photography. As jury-experts for this department the following well-known gentlemen were chosen:—Messrs. Angerer, Volkmer and Froschl, and Prof. Eisenmenger. A great number of the most prominent studios, both native and foreign, were represented in this exhibition. In the process of heliography R. Schuster, of Berlin, astonished many with his wonderful picture "The Great Electoral Prince Receiving the French Refugees," by Vogl, and many other subjects. By the same process F. Hanfstaengl, of Munich, exhibited "Happily Landed," by Raupp, and the Berlin Photographic Society exhibited "The Commentaries," by Lonza. Also worthy of mention were Dujardin's capital reproductions of head studies, and Boussod and Valadin's reproductions of a chalk drawing by Marek, hunting pictures after Pausinger, &c. Photo-lithography is represented only by the firm of O'Consee, of Munich, who undoubtedly take the lead of all others in this work. In the collotype department the most interesting reproductions are those of the old masters by Bruckmann, of Munich.

Preliminary Hypo Bath for Negatives.—The question as to whether there are really any advantages to be gained by the use of a preliminary bath composed of a very weak solution of hyposulphite of soda, before development, is one that has been occupying the attention of many of our leaders in this country, although I fear very little notice is taken of it in England. In a recent number of the *Photographische Mittheilungen*, Herr Gaedicke publishes some very interesting experiments in this direction. A number of dry plates of the same emulsion of a high degree of sensitiveness were exposed under perfectly similar conditions under a sensitometer, composed of from one to sixteen layers of paper mounted one on the other. These graduated fields were numbered one to sixteen successively. The source of light, distance, and time were similar, so that on all the plates there was an equal influence of light The development was now varied, in order to discover whether, by one or the other modification, a more extended picture, implying a higher sensitometer number, could be produced. First a plate was developed as usual with oxalate of iron. In order to be quite sure of bringing out the whole image, it was allowed to remain in the developer five minutes, although, according to experience, 2½ minutes would be quite long enough for the emulsion employed. The extreme legible number when, after fixing, the plate was held towards the northern sky, was No. 11. In experiment three, the plate was previously immersed in a hypo bath 1 to 2,000 for twenty seconds, then well rinsed and developed. The picture appeared in about one-seventh of the time; but with longer development a veil was formed. The extreme visible sensitometer number was 11, the same as without a preliminary bath. Therefore, the preliminary bath produced nothing farther than the development without it—in other words, the sensitiveness of dry-plates is not enhanced by a preliminary bath of hypo, but of course the process of development is materially expedited. Experiment No. 4 was a repetition of experiment 3, with the modification that no rinsing of the plate took place after the immersion in the preliminary bath, so that a portion of the solution still adhered to the film. But the development could not be prolonged, as too strong a veil appeared. The last legible number was 11. From this it will be seen that if such a preliminary bath is to be employed, a thoroughly good rinsing must ensue before development. In contrast to the foregoing, experiment 5 was a plate developed without a preliminary bath, and to every 10 c.cm. developing-solution, one drop of bromide of potassium 1 to 10 was added. As would be imagined, the development was greatly protracted, and after six minutes only the number 9 was attained. The numbers 10 and 11 were not as yet visible; that shows that in development with bromide of potassium the finest high-light details are not brought out. In continuing his experiments, Herr Gaedicke tried the effect of the addition of bromide of potassium to the developer, and afterwards some hypo solution. The effect was that the development was hastened without any formation of a veil. The majority of dark chambers are not renowned for affording a superfluity of space; as in ships, every inch of space must be available, and all unnecessary utensils must be banished. Among these doomed vessels must be reckoned the preliminary bath. Herr Gaedicke made several experiments to determine the relation of hypo and bromide, and found that the proportions 1 to 6 were the most favourable. He recommends the following solution :—

Crystallised hyposulphite of soda ...	1 gramme
Bromide of potassium...	6 grammes
Water	60 „

With this solution he took one drop to every 10 c.c.m. of developer, and developed one of the exposed plates. The image appeared in about the same time, and the whole development lasted, perhaps, half the time required with the ordinary oxalate development. The least legible number was 11. The whole image was brought out, but in a much shorter time. The picture was perfectly free from veils. The addition of bromide and hypo is therefore undoubtedly to be preferred to the hypo bath—firstly, because the veil is avoided; secondly, the troublesome manipulation of the preliminary bath is saved; and, thirdly, because space is saved in the dark room. But besides being an accelerator of the development, this addition possesses a still greater and more important advantage—*i.e.*, the character it imparts to the negative. When we develop a negative in the ordinary manner, the strongest lights first make their appearance—in a portrait the linen and the flesh, and lastly, the deeper shadows, such as the marks in black clothing. The development of the latter may last so long that in the meantime the lights which first made their appearance become so thick that in the prints we find no modulation in the flesh, which appears as a white uniform mass without any fine details. By the addition of the solution given, the entire surface develops itself at once; that is to say, the details in the deepest shadows appear almost simultaneously with the strongest lights, only that the shadows soon cease to develop farther. The picture looks at first quite weak, but this is soon altered. The high lights refuse to develop farther, and the dark parts continue to strengthen until sufficient density is attained. As a means of better controlling the process of development, this simple arrangement should not be wanting in any photographic studio, and should be used with every development when there is no reason to expect an over-exposure. For the development of instantaneous photographs, this addition is also to be recommended.

AN AFTERNOON WITH THE CAMERA CLUB.

BY WIDE ANGLE.

There is a thoroughly characteristic air about the Camera Club. No one could mistake it for anything else but the home of photographers. The recent conference has of course made its proclivities more prominent, for during the last few days the walls have been hung with photographs, the work of the members, while a large table covered with apparatus has invited inspection of the latest mechanical novelties. But in the ordinary way, I fancy, the Club is intensely individual, and its general conversation would be Greek to the conventional club-room gossiping politician unless he happened to be a photographer—a very unlikely thing.

If a man is not a photographer, it is of no use his joining the Camera Club. He would be terribly bored, or would take up photography in self-defence. To the non-fisherman an hour or two at an angler's club is rather a trial, but the angler's technicalities are nothing compared to the photographer's. What meaning do "stops," "drop shutters," "dry plates" "over-exposure," and the rest convey to the uninitiated? Nothing at all; yet they might be able to grasp the idea of a twelve feet rod.

There is, however, a point of resemblance between an angler's and a photographer's club. The members of both are fond of relating their exploits, not in a boasting spirit, but purely out of a desire to give information to their fellows; and if an angler, in the heat of imagination, adds three or four pounds to the weight of his fish, or a photographer protests that he looked upon the plate as quite spoiled, and never imagined what an admirable picture he was going to produce until he developed it, no harm is done. For in regard to photographers, both amateur and professional, I have rarely met one who, while showing his work, did not say, "But the light was so wretched!" or, "You see it was so late in the day!" Somehow those occasions on which everything is favourable rarely happen. But it is this delightful variety which gives photographers so much to talk about.

The photographic dealers also assist in contributing to the conversation. It is for the benefit of the amateur that new cameras are being invented every day. It is to him that the inventors of the numberless drop shutters, each one more efficient than the rest, appeal. All these matters must be discussed, and experience compared. And so the conversation at the Camera Club is intensely photographic.

But, after all, is this very wonderful, when the Club possesses its own dark room, and a dark room which for size and appointments may be said to be almost luxurious? While the Photographic Society has been sighing for a dark room, the Camera Club has accomplished what to the Society would seem at present to be an impossibility. The Club also has its own Journal, in which its own papers and discussions appear—a very creditable production, and complete even to the "trenchant criticism," the bold attack, and the "crushing" rejoinder, in which photographers delight.

But the members are not mere talkers. The pictures already referred to prove this completely. Some of the photographs were exhibited in Pall Mall, and therefore are familiar. Others there are who are worthy of mention as showing manipulative skill and artistic feeling. The yacht pictures (platinotype) of B. Wild, G. Davison's capital studies of seaside and country life—a village scene remarkable for its quiet aspect of nature—and H. Stevens' photographs of flowers, are all interesting. Mr. Douglas Rodgers aims at artistic effects through the medium of double printing by means of lantern enlargements, the lime light, and developed prints, and must be congratulated on his success. His picture of a scene at the head of a pier is very breezy and full of action, and is one of the few instances in which the sky from another negative has been introduced with a satisfactory result. Mr. Rodgers has also been successful with paper negatives, his views of Isleworth leaving little to be desired. His lion at the Zoo is also very good, and unphotographic in the conventional sense of the word.

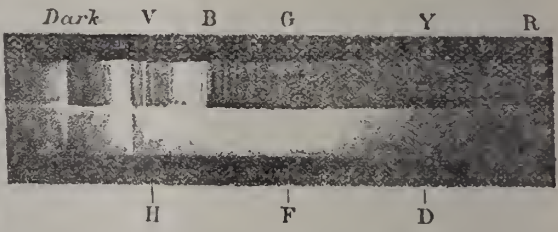
The yacht pictures of N. Leventhorpe and W. A. Green are overtopped by H. Hyslop's pictures of similar subjects; but this is no discredit to the first-named, as those who saw Mr. Hyslop's work at Pall Mall will admit. The work of J. Gale, W. Adcock, and Capt. T. M. Brownrigg is too well known to need comment; while it would be difficult to surpass the excellence of B. M. Copland's interiors. There are several other exhibitors—R. Tindall, A. R. Dresser, Dr. Lindsay Johnson, C. Spires, among the rest—but the pictures particularised are the most noticeable.

The saunter round the Club room, on the walls of which was so much good work, was necessarily very pleasant. Apart from this there was the attraction of the social element, which it is pretty certain has played an important part in the success of the Club. Photographers now-a-days like to take their instruction in a palatable way. There are, of course, purely scientific luminaries, but the majority are practical, and practical information can only be extracted, especially from the diffident, when—but perhaps I am assuming too much, for I quite omitted to inquire whether the Camera Club reads its papers and discusses them with the assistance of the cigar and the cheering glass.

THE ELECTRIC LIGHT.

BY CAPT. W. DE W. ABNEY, R.E., F.R.S.*

Our results of the crater of the electric light given in the last article may now be added to. It should have been stated that the value for the top part of the inclined crater is not quite so large, being 20,300 red candles, and 105,000 green candles. We now come to the value of the arc. It was found that with a more powerful machine —what was known as the D gramme machine—the light due to the arc was about 7,500 "green candles" per cubic inch. However, leaving the light *quâ* light for the present, we will now see what effect it has on a photographic plate, and on paper for silver printing. A very simple plan to test with the latter is that which has already been described, viz., by placing a lens near the light, and throwing a slightly enlarged image of the points on the sensitive paper. It will be found that, simultaneously with the crater, the arc has made a strongish impression. It will also be seen that the thickness of the arc has a good deal to say to the matter, as well as it has in the matter of illuminating power, for it must be remembered that the arc is transparent, and the whole volume of light is effective. This, then, points to the fact that for silver printing by the electric light a lamp should be used which has a long arc; for a long arc also means a wide arc. Thus for economy it should be the rule to use a battery or machine which should allow a long arc to be formed with thick carbons; for the thickness of the arc, or the size in every direction, depends very largely on the size of the crater, with which object it is hoped my readers may now be familiar. Now let us see why the arc is so good for printing on silver chloride. The annexed figure represents the spectrum of the electric light and the arc. In the figure, V is violet, B is blue, G is green, Y is yellow, R is red. The top band is that of the arc alone, and the bottom band that of the crater, together with the small amount of arc which must always be present It will be seen from this that in the arc we are dealing with rays which do not affect the eyes, but do vigorously affect the photographic salts of silver.



I am half afraid that the readers, on seeing this figure, will at once be inclined to put down the News, or turn to the next page, but I would ask forbearance from all. I will be as brief as possible. The line marked H is about the upper limit of visibility in the spectrum; all to the left of that line is invisible. Yet, looking at the top band, it will be noticed that in the arc there are a couple of bands lying in the dark region which vigorously impress themselves on the photograph (for the cut is taken from a photograph on a bromo-iodide gelatine plate), whilst in the visible part there is one band which impresses itself well, though not with such vigour as the band in the dark part, nearest to H. Looking at the bottom band, it will be noticed that these bands in the dark part still assert themselves; in fact, the crater light has very little to do with the impression made.

Hence, in this region, we may say that the principal light is got from the arc. Now chloride of silver is principally sensitive to the dark rays above H, and gives very feeble image of anything to the right of it. We therefore can now understand why it is that in our experiment the arc, with its great thickness in parts, impressed itself on the chloride of silver printing paper as deeply as did the crater. If, instead of the chloride paper, you substituted a bromide paper, the crater would act beneficially as well as the arc, and if a bromide-iodide paper, the crater would be much stronger than the arc. The reason for this is that the bromide is most sensitive in the blue, and the bromo-iodide in the blue-green. It seems scarcely necessary to make any deduction from these facts, but I suppose it must be done to save my readers trouble; for if any one loves a purely mechanical piece of business, I think it is the photographer. Well, the deduction to be made is that with the ordinary plates used in enlarging, or in the studio, as much crater as possible should be employed, more especially as our lenses are not corrected for the very bright rays which lie in the dark region, on the left of H.

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* Continued from p. 819, vol. xxx.

This arc light is now used in portraiture in some establishments, and instead of the eye of the "patient" being put out, or becoming opthalmic, the kind photographer uses a light reflected from a white concave surface, the actual arc and crater being hidden from view, and only the light from the white surface striking the eyes. Now let us see what loss of light (if any) there is by this method. The direct and uncontrolled light which falls on a sitter, 12 feet off from the lamp I employ, is equal to about 1,000 candles, as I have already stated. Putting a white paper hemi-spherical reflector of 2 feet diameter, and the front 6 inches from the light (which is a most advantageous position), the light falling on a sitter 12 feet off is equal to 500 candles, though the illumination is slightly stronger at the centre of the beam than at the sides. Using ordinary white paint, it is equal to somewhat fewer, and using a light blue it is about 120 candles, so it is apparent that there is a gain by using the reflector instead of the naked light.

If a silvered glass reflector were used, the beam would be so concentrated that it would be unbearable; or even a tin or other metal reflector would have the same objection to it. It is a matter well worth considering as to modifying the colour of the reflector. There is no doubt that the dazzling part of the electric light is the yellow and orange; the blue light is comparatively innocuous to the eyes. Now blue reflects principally blue light and very little yellow, and hence it might be useful to employ a reflector coloured with some such colour in ordinary portraiture; at the same time it must be recollected that if such a light be used, and the accessories or drapery reflect much yellow and green light, such a reflector would be a fatal mistake, since any chance there is of such non-actinic bodies impressing themselves is thereby rendered much less. Which colour may be generally most useful is a moot point; but I may point out that an orange reflector will do away with the use of yellow glass when orthochromatic plates are being used for copying pictures, since blue light reflected is small compared with the predominant yellow.

REJLANDER'S PHOTOGRAPHIC ART STUDIES —THEIR TEACHINGS AND SUGGESTIONS.

BY A. H. WALL.*

Chapter VIII.—Domestic and Fancy Subjects.

In his treatment of subjects of domestic or familiar life, Rejlander's bent was towards the humble and humorous, although the pathetic and tender phases were not overlooked, as witness his "Widowed and Fatherless," a copy of which is before me as I write. The little child, pained by witnessing its widowed parent's tears, half unconscious of the loss both have sustained, winds his chubby little arms about the mother, and raises and advances his cherub face to give the consolement he has so often received, that of a loving kiss. The expression of each is centred in the face, and looking at the female's it is really hard to conceive she was merely playing a part—it is so full of such apparently real sorrow.

Here, again, the keen observation of the artist in selecting a model, and his power of playing upon the feelings, through the imagination, doubtless were the secrets of his success. In it, too – so far as the print before me goes—the treatment and general tone of the photograph is in accordance with the ruling sentiment. The lighting is soft and quiet, the shadows tender and delicate, and the whole effect subdued to greyness, without being, however, in the least degree productive of flatness, or a want of depth and modelling.

"The dear creature! she's looking at me," was another of his subjects, the mere thought of which makes me smile. It represented a face of supreme ugliness at a window, resting upon and framed by huge hands, the elbows resting angularly upon its sill. A grin of unmistakeable self-gratification and conceit, irradiating the phiz, added to its comicality, and made the story began by its title complete. The artist, in lighting this face, strongly illuminated it, and in the development had seemingly the same end in view, that of giving the greatest force to the facial features and markings. A dark background, which is not, however, a flat one, projects the head well forward, and adds power to the idea of the odd creature's seeking the admiration he regards as due to his personal charms.

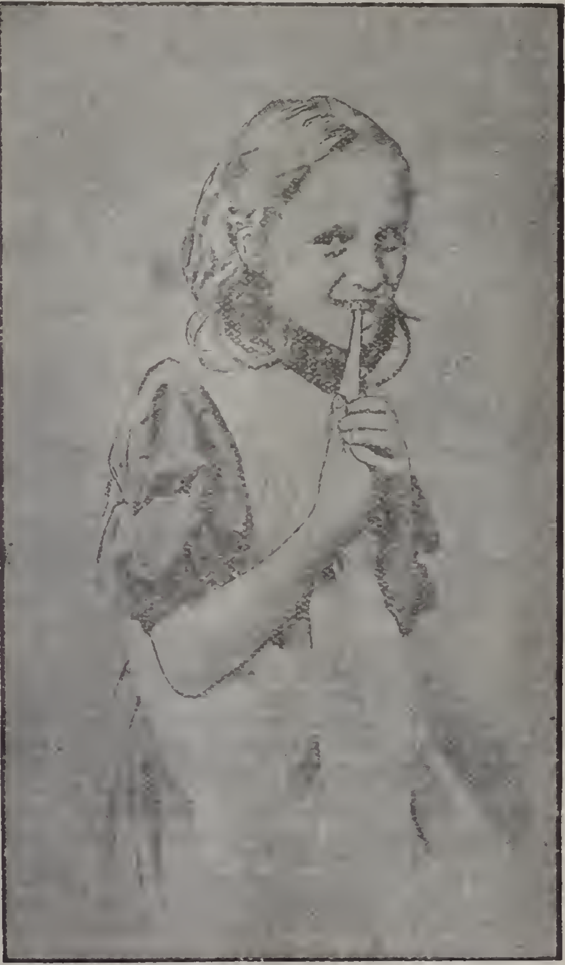

Fig. 1.

I have forgotten the title given by the artist to this photograph (fig. 1), but its story is a familiar one, to which few would find it difficult to fit a name. Half shy, half sly, and archly smiling, while biting the end of her pinafore, which she also unconsciously tugs at with both hands, the model was altogether unlike a model of the ordinary type, and plays her part in a way that suggests anything rather than consciousness of a photographer's camera being in front of her. It is a bit of real girl-life and feeling such as everybody has witnessed and can at once appreciate.

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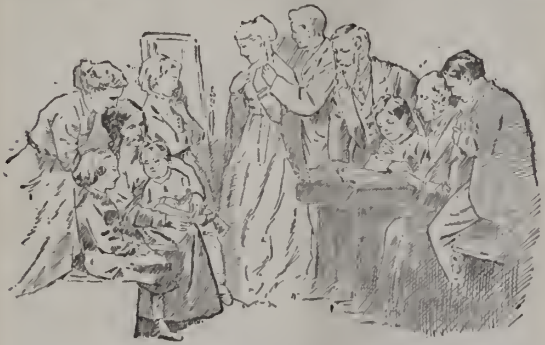
* Continued from page 536, vol. xxx.

There is another picture of which I have forgotten the title, in which the artist's humorous fancy found play, which is also worth a note. It was a back-garden view, in which an entire household are seen stirred to its very depths by a most common but interesting event: the maid and the man-servant are making warm love outside the door of the back kitchen. From the windows above the children peer down, from another window the grandmother, and at a French window the master and mistress are stealing forth to detect the culprits. Rejlander's mother-in-law, sister-in-law and her husband, himself and child, his maid-servant and his wife, were the actors in this little comedy. There was not the slightest mistake about the love-making—the clasped hands, one pressed tightly to his breast, the smile of tenderness, and the graceful bend of her up-turned head, told the story eloquently. To balance the whole composition, a rocking-horse was put to admirable use. The picture had its great fault, however, in a preponderance of useless material—too much of the unimportant, uninteresting at sides and top, and far too much foreground, all of which only served to dwarf the figures, decreasing their relative importance. We may often, by the mere action of a pair of scissors, define subject as distinct from mere accessories which neither help the story by adding incident or expression, nor help it in composition—rather the reverse. In a copy I have, the scissors have been benevolently exercised, and the photograph, although greatly reduced in size, is, I fancy, also greatly the better.

Another picture of the class I am speaking of was called "Sunday Morning." It represents a large group just after the Bible has been read and a prayer pronounced by the head of the family preparatory to their starting for church. The sons and the daughters are there with the mother, who sits amidst the little ones, and has one on her knees, an elder sister bending over them. The eldest son is rising from the table at which his father sits, and one of the grown-up daughters is putting on her outdoor attire at the glass, assisted by a young fellow who is apparently her lover. They will evidently be the first to start—one easily guesses why. It is a bit of domestic life which commanded Rejlander's serious sympathy, for although he was not himself a very regular churchgoer, his religious instincts were always strong, and he was not amongst those who think it a mark of superior intelligence and cleverness to sneer at religion. I can remember whenever the subject cropped up that he always spoke of it reverently, in a philosophic and investigative spirit, it is true, but with an awful sense of its mysteries, and never lightly or jeeringly. Of those who mocked at religion he used to say that they could never have approached the subject studiously for all nature was full of arguments demonstrating its, supreme importance. This, however, by the way. Let us turn to another kindred subject, a study of a head called "Prayer," a beautiful and refined profile, with just


SUNDAY MORNING.

PRAYER.

A PENSIVE MOMENT.

that gentle curve of the short upper lip which gives the expression of appeal, while the clasped hands indicating its earnestness, although the general effect is that of placid faith and pious confidence.

I have called the next photograph "A Pensive Moment,' although I think it originally bore another title. I well remember the charming original—now, alas! no more. Rejlander frequently made her his model, and he could not well have had a more graceful one, or a face more mobile in expressing varying emotions. He used to watch it very attentively. I have often seen him doing so, and when the conversation called up some expression more than usually forcible or eloquent, would make a mental note of the subject of conversation and its treatment, in order that he might hark back to it on some occasion when the camera was *in situ* and a new subject wanted. For, as I said before, every place was a studio for Rejlander, and everybody he came across the possible model for a new picture. This particular face was not, however, usually changeful; its most frequent expression was one akin to the pensiveness it here wears. I often wished to paint it, but never had the opportunity.

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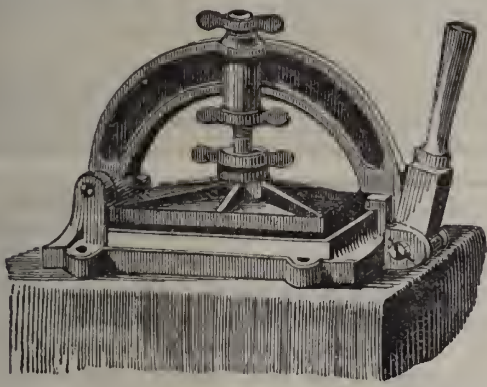
HOW TO WORK STANNOTYPE.—No. IV.

BY WM. LANG, JUN., F.C.S.

The press used in Stannotype is to all intents and purposes identical with the one employed in Woodburytype. The accompanying sketch shows its general appearance. Before placing our mould in position, we have first to see that all the three screws are loosened, but not detached; the handle is then drawn back, so as to allow the arch carrying the top part of the press to be thrown back, the end opposite to that on which the lever operates being hinged for the purpose. As it would never do for such a fragile substance as glass to be put in immediate contact with cast iron and subjected to pressure, provision requires to be made to interpose something that will yield when the pressure comes to be applied. For this purpose a species of stout blotting-board is made use of, which, when immersed in water, swells considerably. The material out of which the cheapest form of mounts is made—viz., wood pulp—will be found to answer admirably. Taking such a mount, and having cut a piece corresponding in size to that of the glass on which the mould has been developed, we immerse it in water, and allow it to remain till thoroughly saturated. It is then taken out, and allowed to drain; thereafter it is placed on the bed of the press, and on the top of it the mould. The arch of the press is now brought carefully forward, and the press closed. The upper part of the press now rests freely of its own weight on the top of the mould. It may be explained here that the top plate has attached to its under surface a piece of strong thick plate glass. The first screw which requires to be tightened is the one immediately under the arch, then follows the one on the top of the arch, and lastly the lowest screw of all—that which controls the ball-and-socket joint. On withdrawing the lever it will be found that the whole upper portion of the press moves as one piece when the arch is thrown back, and besides, it will always fall into the same position when the press is closed. Leaving for a little the press, with its mould in position, it may be well to consider the ink used in drawing mould pictures; and here it may be stated that fixed quantities as to the various ingredients can scarcely be laid down. The amount of colouring matter that requires to be added depends altogether on the depth of the mould we are actually dealing with. As is well-known, the basis of the ink is gelatine, and a convenient strength to start with may be put down at 1 ounce gelatine to 6 ounces of water, the gelatine being allowed to soak before heat is applied. To imitate the silver tone, indian ink and carmine are generally used. Alizarine has been recommended, but as far as the writer's experiences go is much more troublesome to manipulate than the carmine, a strong solution of which can easily be made by dissolving this substance in liquor ammonia. A black, somewhat resembling platinotype, can be obtained by the use of indian ink alone. Of course, it is optional to add any colour should the operator so desire. The temperature at which the gelatine ink should be kept ought not exceed 130° F. An ordinary pot placed over a Fletcher's Bunsen burner and filled with water makes an excellent water-bath in which the various bottles containing inks of different intensities can be placed. Common black bottles may be used for holding the ink, and will be found sufficiently convenient. The recommendation of Mr. George Smith to add a little mercuric chloride in solution to the ink is a good one, as the ink will thus keep indefinitely, otherwise we would require to pour over the gelatine ink, when set, a certain amount of methylated spirit to prevent decomposition. With reference to the indian ink employed, more speed can be arrived at in our operations by using the liquid form, which can be purchased ready to our hand. I believe also it can be obtained in quantity in a moist form in tubes from Newman, Soho Square. The making up of the colour from the cake is somewhat tiresome.



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Notes.

Two supplements are issued with the Photographic News to-day: a phototypic reproduction made by means of the grained dry plates of Brunner and Co., of Winterthur, in Switzerland; also a table showing the relative rapidities of various stops according to the standard of the Photographic Society, and according to the standard of Dallmeyer.

Dallmeyer contends that the arbitrary standard selected by the Photographic Society of Great Britain—viz., $\frac{f}{4}$ as unity—is an unfortunate one, and that considerable advantage as regards ease of calculation will result from the use of $\frac{f}{\sqrt{10}}$ as unity. This he explained in a paper communicated to the News in September last. The table was originally published as a sheet, for issue with his pamphlet on the "Use of Photographic Lenses," but it has been made up into four-page form for convenience of issuing with the News.

The point to be remembered in connection with the pictorial supplement is the circumstance that the grain or network is impressed on the gelatino-bromide plate before

Brunner and Co. send it out, so that if one of these special dry plates is exposed and developed, a grained negative is obtained at once, and from this a transfer can readily be made by one of the well-known photo-lithographic methods. This transfer can be put down on a zinc block, for etching into relief; or it can be transferred to stone, for printing in the lithographic machine.

Could it have been one of those persons who "always come out badly" who perpetrated the unfeeling hoax on three unfortunate Cambridge photographers this week? One can imagine the high spirits in which they must have started, full of the distinguished commission to photograph a group of "sweet girl graduates" standing round the plane tree planted by the hands of the great English statesman. Prospects of wealth beyond the dreams of avarice, arising from the sale of copies of the historical picture, must have floated before the eyes of each; and then to find the tree gone, no ladies present, nobody, in fact, but two rivals, both intent upon the same object! We can readily understand how, as we are informed, they glared at each other and fled from the spot. It is a pity that each did not secretly secure a photograph of the other two as an interesting memento; but under trying circumstances it is not easy to retain one's presence of mind. The Cambridge papers, we note, are very reticent over the business, and speak of it as a "rumour"; but it is a true tale.

Amateur photographers who read last week's *Truth* must have noticed, with some amusement, the following delightful paragraph:—"The majority of amateur photographers have still much to learn in the art of finishing off and touching up their negatives, without which processes no photograph can be a really satisfactory portrait of the sitter." Indeed! One would like to know where this oracle derived his knowledge and his taste. If there is one thing the amateur had better avoid, it is "finishing off and touching up." An example of this "process," in all its hideous hardness of outline and falsifying of truth, is now to be seen in the latest portraits of a well known society actress; but if this is the kind of thing admired by the writer in *Truth*, he will get very few honest photographers to agree with him.

The annual meeting of the Photographic Society, held on the 8th inst., was adjourned—a very unusual course and one which has given rise to much conjecture. Ordinarily, the adoption of the report of the secretary and the report of the treasurer is put to the meeting. This was not done, and, before rising, the chairman distinctly said, "This *meeting* is adjourned," &c., and thus indicated that the adjournment did not refer merely to the discussion on the paper read.

A rumour, which appears quite absurd, is afloat—viz., that nominations for the council, made by two members of the Society, have been rejected on account of some real or supposed informality; but this is difficult to believe, as, if a nominator had committed any informality in his nomination—as, for example, by making a clerical error, by proposing any person ineligible to sit, or by exceeding his privileges as proposer—one may assume that his communication would not go into the waste paper basket, but that the mistake would be explained to him, so that he would have an opportunity of making the required correction.

The following is the rule relating to the election of officers, and it is quite possible that it may come under discussion at the adjourned annual meeting:—

> The mode of election of officers shall be by ballot of the entire members of the Society. The president shall retire annually, but be eligible for re-election. One of the vice-presidents shall retire annually by seniority, and shall not be eligible for re-election as vice-president for that year, but shall be at once eligible for election into any other office.
>
> Six members of the council shall retire annually by seniority, but shall be eligible for re-election. Every member of the Society shall be at liberty to nominate gentlemen to fill the vacant offices; such nominations to be sent in to the secretary not less than twenty-one days before the annual meeting. A balloting paper, containing the names of the retiring officers, together with a list of the gentlemen nominated, shall be sent to every member of the Society, with instructions to erase all names with the exception of those for whom he desires to vote. Such balloting paper shall then be placed in an envelope provided for the purpose by the Society, and forwarded to the secretary in time for the annual meeting in February. The secretary shall place such envelopes unopened in the hands of scrutineers duly appointed by the Society, who shall announce the result of the election before the close of such meeting.

Singularly vague is part of this rule, the phrase "every member of this Society shall be at liberty to nominate gentlemen to the vacant offices" being quite clear as far as it excludes women from the council, but subject to some doubt as regards other points. We are under the impression that there is some *legal definition* of a gentleman; if this is so, and if the wording had been "every member of the Society shall be at liberty to nominate one gentleman to fill each vacant office," the phrase would have some real meaning. As it stands, however, it will reasonably bear the interpretation that every member may nominate as many gentlemen as he pleases.

"The lens works to focus with orthochromatic plates, although with ordinary plates the visual focus is not the same as the chemical focus." So says Spitaler in reference to an astronomical telescope at the Vienna Observatory.

Here we have a reminder that in using orthochromatic plates with the full aperture of a lens, it may be necessary to make an allowance in focussing.

As regards the production of platinotype prints, the letter of Léon Vidal, published in the Photographic News of last week, page 82, is of very special interest.

A somewhat over-printed silver print is immersed in a solution of bichloride of platinum (or tetra-chloride, as modern chemists call it) until the greater part or the whole of the silver is replaced by platinum; and, should one wish to remove all traces of silver, it is an easy matter. Treatment with a solution of bichloride of copper, or of perchloride of iron, rapidly converts any metallic silver into silver chloride, and this silver chloride can be dissolved out by the ordinary hyposulphite fixing bath.

With regard to this method of producing platinotypes—indeed, the oldest method of making photographs with this metal as a basis—Vidal says:—

"We only insist that platinum toning allows us to obtain, at less cost than by any other means, images having platinum as a base; and, under conditions as to rapidity, of great value. We believe we render a service to our photographic brethren by pointing out a method destined to extend the field of their labours. No one has up to the present, so far as we know, published the means of assuring the permanence of impressions obtained upon gelatino-bromide of silver papers, at the head of which we do not hesitate to place those of the firm of Eastman and Co."

The *Pall Mall Gazette* is an adept in finding out something which everybody but the *Pall Mall* has long known. Its latest discovery is that the popularity of personages, exalted and otherwise, may be estimated by the number of their photographs sold. As statistics of this kind have already been given to the public *ad nauseam*, we will not quote the *Pall Mall's* figures, especially as the particular information is very stale. But what a guileless young man the interviewer must be who could imagine that a photographer goes to the theatre in order to take the portraits of actors and actresses in costume! All these photographs, which represent certain scenes in plays, have such an unmistakebly "Studio" look about them that no one but an innocent interviewer could fail to know where they were manufactured. But the interviewer's lot is not a happy one, and perhaps the question was put in order to draw out the reply.

Either prison photography is very bad, or the wood engraver employed by the police authorities is only equal to the production of pictures about the level of a Catnach ballad illustration. Now that the man charged with the Hoxton murder is face to face with his captors, it is discovered, the *Globe* informs us, that "there is no resemblance whatever between Currell and the hideous 'likeness' published upon the Police bills," and that it would have indeed been a remarkable circumstance had the police succeeded in arresting Currell from any resemblance to the photograph they had obtained. The *Daily Telegraph's* experiment cannot be said to be much better, although it has been "approved at Scotland Yard," since it suggests the portrait of a man with both eyes severely blackened, and connected across the nose by a strip of court plaister. From the context it would appear that the *Telegraph* artist had added to the Police original such bits of description as Currell's friends had furnished. The original photograph, we imagine, was taken when Currell was "in trouble" some time ago. Whether this was so or not, the wood-block was simply ridiculous, and indeed on the score of accuracy wood engraving for purposes of identification is behind the age.

The case of McLachlan *v.* Agnew is inexhaustible. On Saturday it re-appeared in a fresh place—in Bow Street Police Court—Mr. McLachlan applying for a summons to compel his solicitor to lend him certain papers in connection with his recent action against Messrs. Agnew, which papers the solicitor, apparently, retains as security for his fees. Mr. McLachlan incidentally stated that he had had five solicitors, and that the papers would take months and months to read, a statement which we can readily believe. He also expressed his intention of proceeding against certain persons for perjury, opening up a prospect of further litigation which, considering the complicated nature of the case, offers a dismal prospect. As, however, the magistrate refused to grant the summons applied for, this projected litigation is probably some distance in the future, for the absence of these voluminous papers, which take five months to read and a few more to understand, must be a serious obstacle.

The easiest way to make a new discovery in photography is to take up some long-forgotten experiment, and bring it forward as a novelty. Moser's theory of invisible rays is perhaps forgotten by some, but M. Zenger, a French man of science, has, according to the American *Manufacturer and Builder*, kept it in mind, and his experiments appear in several American papers under the head of "A New Departure in Photography." M. Zenger's plan is to put a piece of white paper with a picture or some words written or printed upon it in the sunlight. After so remaining for an hour, it is placed in contact with ordinary sensitive paper, and the result is a copy of the original. Indeed, so well has the method answered, that M. Zenger has since used this system to copy bills and notes. "The general result of M. Zenger's researches is," says our contemporary, "that many substances absorb luminous rays during the day, and at night emit those rays in such a manner as to be able to impress sensitive plates, although they do not impress the retina." M. Zenger has also been experimenting with Balmain's paint, and exposed a plate for a quarter of an hour at midnight on the terrace of the astronomical observatory at Prague. This plate was then left for some hours in contact with an ordinary photographic plate, "and the result was very satisfactory, since the monuments and terraces whose invisible images had been concentrated on the first plate came out very well on the second."

J. Ruskin has just pronounced an opinion, in his authoritative, oracular way, that "it is impossible for Manchester, or any towns the least like Manchester, to have schools of art at all." Art, according to Mr. Ruskin, therefore cannot exist in Manchester. This is a bad look-out for any photographer who may have settled in this grimy city under the impression he is going to produce artistic work. Can this be the reason why Manchester was so poorly represented in the last Pall Mall Photographic Exhibition?

Manufacturers who want to register a trade-mark for a new paper, a new brand of gelatine plates, or a new camera, may perhaps like to know what constitutes a suitable word in the eyes of the authorities. We learn from a judgment just delivered by Mr. Justice Chitty that the Court of Appeal holds that words to be registered as fancy words must be obviously meaningless as regards the particular goods to which they are sought to be applied. Mr. Justice Chitty therefore laid down in the particular case before him that the word "Jubilee" did not come within the rule as applied to paper. It was not obviously meaningless, because it might signify that the paper was for use in the jubilee year only. Moreover, the word "Jubilee" was used by many English writers, including Chaucer, Dryden, and Sir W. Scott. It was, therefore, a common English word. To a lay mind, all this looks very much like solemn quibbling, but it is as well that inventors should know the law. To be on the safe side, and so avoid expensive legal proceedings, they will have to invent "nonsense words," something after the fashion of the puzzle competitions over which a certain section of the public have gone mad of late. "Jubilee" under the aspect of "Bulijee" would, we presume, be upheld by the Court of Appeal as perfectly admissible.

Stieglitz timed himself in making a gelatino-bromide negative, and a print from it on Eastman paper. This is the result as given in the *Mittheilungen*:—

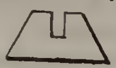
To focus and expose	2 minutes
„ develop	3 „
„ fix	3 „
„ wash	1 minute
„ print from wet negative, on the Eastman paper	1 „
„ develop and treat with acid ...	6 minutes
„ fix	6 „
„ wash and treat with eau-de-javelle	10 „
„ dry with alcohol	4 „
„ trim and mount	3 „
	39 minutes

We cannot recommend our readers to emulate Herr Stieglitz, as it must be remembered that acids react on hypo with the precipitation of sulphur; and it is very questionable which is the more objectionable if left in a print—hypo or eau-de-javelle. The former destroys the image, while the latter rots the paper which supports the image.

A "print sinker" is a useful device referred to by our transatlantic contemporary, the *Photographic Beacon*.

It consists of a strip of lead or type metal with a groove on one side, and flattened on the other, so as to lie with the grooved side up, the object being to hold prints in an upright position during washing, and so materially facilitate that operation. Of course a sinker is required for each print, the edge of the print being placed in the groove, and fastened there by one or two small wooden wedges.

Here is a full sized section of the metal strip as it should be made for the purpose, and any reader who has a small



amount of mechanical instinct can easily construct a mould in which to cast such strips: a wooden mould will serve very well.

The moulded lead used in mounting stained glass will serve the above purpose fairly well if one pair of ribs are turned outwards, so as to make a base upon which the strip can stand.

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PHOTOGRAPHIC PORTRAITURE.

BY WILLIAM CROOKE.*

As the painter must ever be beholden to his brush and other mechanical aids to the expression of his genius, so must the photographer make intelligent use of his appliances in order to the production of his best efforts. As portraits may be painted or produced by other means than those usually employed, so may photographic portraits be produced without a studio, but to the professional man the studio is as necessary in the one case as the other. Amid all changes certain requirements remain, and the studio is one of these. Let me say a word about it. All manner of construction and situation is to be found, and probably advocates for every variety we can think of; but while many are compelled to do with less than they could wish, or a different situation than they could desire, a very general inclination will be found in favour of a north light. My own preference is decidedly towards a north or north-east aspect. My studio is seven feet six inches in height at the side, rising from that at an angle of 45°. This I consider a good serviceable height. It will be found that a high roof lessens the effective control of the light by the operator, without which just so much more difficult and uncertain will it be to obtain the most satisfactory results. The construction of a studio, apart from its relation to the principal light, has not, I think, very much effect one way or other on the work produced in it, unless it is of a most awkward and inconvenient description. It must be a very faulty studio, indeed, in which good work cannot be done, provided there be on the part of the operator the necessary knowledge of the requirements of any particular case, and how to meet them by skilful adjustments, and what I might call artistic tact.

In the matter of lighting the subject, one man's work is apt to partake of a certain uniformity of character, arising from his constantly working under the same, or nearly the same, conditions. A very common error many operators fall into is to set every sitter on the same spot and endeavour to direct the light they judge most suitable on that spot, instead of trying the effect of different points, where they may be placed in relation to the main light, in fact, bringing the "mountain" to Mahomet, instead of Mahomet to the mountain. Where the facilities for doing this are very limited, or where it cannot be done at all, there is no more to be said, and the best must be done with what is available.

Where we have to deal with strong contrasts, such as white hair and high complexion, or white and black draperies, the subject will be most effectively treated by being made to face the light; where the conditions are reversed, an opposite treatment, according to the particular demands of the case, must be resorted to. The matter can only be referred to in general terms. A skilful operator will determine what to do when the subject comes into his hands, and especially when he sees the sitter in the light which falls just about where he is to be taken.

If good lighting necessitates considerable study and knowledge of effects, posing demands no less; indeed, the art of lighting a subject may be mastered with tolerable completeness, while posing may never be thoroughly acquired, because it is less of a mechanical accomplishment. It calls for a knowledge of harmony of lines, and the effect of balancing of parts—what, in short, is described as composition, and which every one does not naturally possess. An operator may fail in this, just as painters sometimes do, who, though good colourists, are defective as draughtsmen, and in the ability to conceive a good picture. We sometimes feel that photography is too literal to be artistic. From a client's point of view, its tendency is to exaggerate the imperfections rather than the perfections of face and figure. Should you have a stout figure to photograph, the neck, as a rule, will appear short. To obviate this appearance in the portrait, it is best to adopt a standing pose, with the camera a little below the level of the head. If a sitting position is chosen, undue height will be given to the shoulders, and the shortness of neck will be emphasised. In treating the opposite extreme—a thin figure with sloping shoulders (not so objectionable in the gentle as in the sterner sex), I would recommend a sitting pose, and in the case of a gentleman, especially when the head is large, a little drapery, in the form of an overcoat, loosely thrown back. The head should be turned in the reverse direction from the angle at which the body is placed, which will help to give the appearance of substance and harmony to the figure, and altogether make the picture more pleasing. A little attention of this sort will improve defects in the sitter just as easily as the want of it may produce them where they ought not to exist. As a rule, twist the figure as little as possible when the person is stout. Some people turn the head more gracefully in one direction than in another; the head seems balanced in the one case, while in the other it may be the line of the neck and shoulder forms too great an angle. Should it be necessary to take that view of the face which gives prominence to this defect, turn the figure away, and the head towards the camera.

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* Abstract of paper read before the Edinburgh Photographic Society.

Allow me to say a few words as to the treatment of the different features of the face.

When the forehead is high and broad, no particular attention need be paid to the view taken of it; but should it recede too much, and a side or three-quarter view of the face be wanted, let the outline blend with the background. The same treatment should be resorted to where there is an undue fulness of the upper part—of course in children this is common, and is no defect, but when occurring in the adult, is better to be modified.

Very often one brow droops a little, or the eyelid may have the same tendency, in which case I find the best plan to avoid exaggerating this inequality is to turn the figure to that side and the head towards the camera, keeping the droop in the shadow. Variety in noses is endless; make the lens look down at the short, and up at the long, or rather place them in these relations to the lens. If the outline be ungraceful, modify it by more front view. A really good or beautiful nose will be valued by its possessor, and its beauty will be best exhibited by a slight turn of the head; a broad nose is improved by the same treatment and a somewhat sharp light.

The full eye, when light, is difficult to manage, and if all other conditions are suitable, should be turned away from the light; in fact, the greater portion of the face should be in shadow. When the eye, on the contrary, is dark, avoid reflections which show with marked effect on the eyeball. A sunken eye is generally turned towards the light, but I prefer it turned away, and the light diffused with a medium, such as tissue paper close to the head.

With reference to the mouth, the chief want felt in photographs is lightness and transparency of shadow, caused by the non-actinic colour of the lips, as where they are brightest, and therefore most beautiful, the photograph gives the reverse effect. A good deal can be done on the negative to rectify this.

No man will succeed to any great extent as a portraitist who does not exercise a constant and intelligent observation on all that affects his sitters. Details that to a careless or unobservant mind might seem too insignificant to pay any attention to, may yet be of the greatest importance. The things which go to make a pleasing portrait in any one instance may be in themselves little matters enough—the turn of the head one inch this way or that, the raising or lowering of the eyes ever so little—nothing, in fact, is too small to notice. Let the eye of the operator acquire the habit of taking in his whole sitter. How different is the expression of a lady or gentleman when at their own table, or in the midst of friends on any social occasion. How vastly different from what we see them when about to take the cap off the lens. An active consciousness enters in and deprives the picture of natural grace and beauty, as well as freedom of expression; the hands very often suffer, losing entirely their natural disposition. When you are thoroughly acquainted with your subject you cannot be deceived by this conscious expression, and you can remind your sitters that they are not looking like themselves. Now, how can this be said or done when ten minutes previously you did not know such a face was in existence? This is the only reason I can give for so many random and missing shots in photographic portraiture. Knowledge of the subject I say is more or less a necessity when the highest results are aimed at; but you may say, how is this knowledge to be obtained? Are photographers to spend a week or fortnight at their clients' houses previous to photographing them? Such is impracticable, and certainly in the case of small-sized photos, photographer and sitters in the majority of instances must be strangers; but my remarks point more to larger photos direct from life. I consider it risky—I don't say impossible, because it depends on the subject—to take a large direct picture of a person ushered into your presence and out again in the space of twenty minutes. On a first visit a carte might be taken, and on a second visit a cabinet, then the large one when you have gained the necessary acquaintance with your sitter's expression. It is a wonderful art, and because it is so, greater wonders are expected to come out of of it. The stream of its rapid advance is not confined to one channel, but it continually overflows and seeks with eager haste to fields and pastures new.

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ISOCHROMATIC PHOTOGRAPHY.

BY W. H. HYSLOP.*

Before commencing my paper, I would express my exceeding regret that our worthy President has not taken this subject of "Orthochromatic Photography" out of my hands, for had he taken it up and given us the results of his careful research and immense knowledge of the subject, this would, indeed, have been a red-letter day in the annals of photography.

At one time I intended to give you a sketch of the history of orthochromatic photography, but I have come to the conclusion that our time will be better taken up discussing what can be done in the future rather than what has been done in the past, excepting the last three or four years. For those, however, who care to go into the history, I would refer them to the various journals of photography from 1873 onwards.

There is one point, however, in the history, which is indeed strange, and that is the great want of general interest in this most important subject.

When we have named Waterhouse, Vogel, Carey Lea, Eder, Ives, and Abney, we have named, almost without exception, the only men who have written upon this subject during the last fourteen years. Why is this? Is it because we are too conservative, or is it that we have not believed in the experiments and statements of these workers.

In 1883, a patent was taken out, and orthochromatic, or rather isochromatic plates, as the maker prefers to call them, were put on the market. They do not seem to have been generally successful, or brought to common use, and why? Probably because they were found unreliable. For my own part I think that unbelief in any chemical process of orthochromatic photography has been at the bottom of this want of interest.

In 1885 a great cry arose throughout the length and breadth of the British Islands, and why? Because a German firm of photographers had been given permission to erect a corrugated structure in Trafalgar Square, and were allowed to photograph the national pictures. It is not necessary for me to go into the why's and therefore's of the question, but I would like to refer to a paper on the subject, read before the Photographic Society of Great Britain, by Mr. Bird, of the Autotype Co., a paper marked by extreme good feeling, and a desire to give to an opposition firm the full credit due to them.

The paper was illustrated by many examples of Messrs. Braun's pictures, as well as by photographs taken some years earlier by a Berlin firm, and showing the great advance in the rendering of the various colours.

In the discussion that followed, it was, I think, the general opinion that the retoucher's pencil and brush had more to do with the change than any chemical means, and I would just quote "Free Lance" in the *British Journal of Photography* of May 29th, 1885. He says: "Mr. Bird's remarks, temperate and well thought out, are well worthy of being remembered, and, while leaving to his hearers the task of coming to a conclusion as to Messrs. Braun's mode of producing these excellent copies, he enables one to make a shrewd guess at his own opinions.

"It is true that the photographic public have for some time had before them details of a method of photography of great novelty; but, as the lecturer said, 'they were not impressed with laboratory experiments, they remember many discoveries that came to nothing, and improvements that were delusions they are not credulous of the practical application of new ideas.'

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* Read at the Photographic Conference.

"These remarks are not more disheartening than true, and the condition described is not to be explained upon any single basis only.

"Many photographers rarely read a scientific article; others are indifferent, and prefer only to accept acknowledged facts, trusting to their commercial instinct giving them the ultimate advantage over their more scientific brethren, perhaps, most potent of all causes still, others have had such experience of reputed grand discoveries which have eventually proved to be ignominious failures, that they become wearied, and only try fresh plans when they are shown to be commercially successful by the touchstone of experience.

"It would be impossible for one man to try all the new processes invented and published; and a few years' experience will show that those ushered in with the most blatant assertions of excellence are usually the least meritorious, and those deserving, yet modestly proclaimed, discoveries get shelved.

"As Mr. Bird plainly puts it, photographers have had before them full accounts of a method of taking photographs in which colours are represented in a true scale of tones, but they have not adopted the process. Messrs. Braun have produced copies of oil paintings far superior to any previous work of a similar character; do they owe their success to clever retouching, or to some modification of processes not new? We have, through the writer, Messrs. Braun's word that the latter is practically the case, and we have no right to doubt their word.

"They lead us to infer that the method is complicated, and this is what might reasonably be expected; further, we are told they will keep their knowledge to themselves as long as they can, and for this also no one can possibly blame them. If the improvement in Messrs. Braun's pictures should be owing to new chemical methods, photographers may rest assured that they will have to bestir themselves and do likewise; they cannot afford to be stationary."

Notwithstanding the talk at the time, the subject seems to have slumbered again, and for eighteen months nothing much was heard of it; but a time of awakening came, and all credit is due to Messrs. Dixon and Sons for that awakening.

The gentleman who has an interest in the Tailfer patent for this country has at the various societies' meetings done his best to minimise the services of Messrs. Dixon, but I am quite sure that I am not alone in thinking that, had Messrs. Dixon not issued their successful plates, we would never have heard so much of the Tailfer patent, nor would the gentleman have bought the English interest in it.

I now come to my own experiments, and I will give you formulæ, and show examples from the plates prepared by the various formulæ. The plates used in the following experiments are ordinary commercial plates, and the only care taken was that they should all be from the same batch.

It has been said by the unbelievers that the orthochromatic effect is a mere matter of exposure; that, supposing you expose an ordinary gelatine plate behind a yellow screen, and long enough, you will get quite as good an effect as by the staining process. I have never yet heard any of them say how long the exposure should be in order to get the desired effect, but on the card marked A, which will be passed round, you will find prints from ordinary plates exposed on this parti-coloured board, with and without a yellow screen; the first was given 10 seconds without the coloured screen, the others 30 and 60 seconds and 5 minutes with the screen.

If you examine the prints you will find that in the one exposed 10 seconds there is no orthochromatic effect whatever; the light red is fairly good, but the other colours are in exact opposition to what they should be. In the 30 seconds one you will find that the violet and dark blue are darker than in the first, but you will find also that the orange and yellow are darker too, and the light red lost entirely; the 60 seconds plate is, I think, no improvement on the 30 seconds. We now come to the one exposed 5 minutes, or ten times the normal exposure, and here, I think, we get an improvement. We get the light red back again, but, otherwise, there is very little difference.

I think these examples clearly show that to use an ordinary plate, exposing it a fair length of time, and expecting to get a good orthochromatic effect, is not at all practical.

I will now take the series marked A. You will find at the top of this and all following cards a print from an ordinary plate exposed without screen, so that you may compare the various results with it. The first two you will see are from the Tailfer plates; they give a fair effect, but I may tell you that in order to get the two negatives I exposed two dozen plates. I couldn't keep the films on the glass; every known means were tried to save them before and after development, but all to no purpose. You can easily understand, if this kind of experience befell many who tried them, why their progress in this country has been so slow.

The next two are plates prepared by myself according to the specification of Messrs. Tailfer and Clayton, and exposed with and without screen.

I had tried this specification some time ago without success, and Mr. William Bedford stated at one of the Photographic Society's meetings that he had not been successful, but in order to give it a fair trial I tried it again with a like result. The examples give no more trace of orthochromatic effect than do ordinary plates exposed with screen for thirty seconds, and yet these are treated with tetra-bromo-flourescin, one of the claims of the patent.

The third pair on the card are Edwards' isochromatic plates, which give good rendering of blues and yellows, but at the expense of the reds, and this fault is, I find, in all the commercial orthochromatic plates.

And at this point I should like to make an assertion, and for this reason. Mr. Edwards stated, at the last meeting of the Photographic Society of Great Britain, that his plates would give a good orthochromatic effect, in daylight and without coloured glass. Now, I most emphatically state that there are no plates in the market which will give such an effect without a screen, and I very much doubt if anything but a collodio-bromide plate, treated, will give a result different in any way from an ordinary gelatine plate; you can judge for yourselves, by looking at the examples.

And now let us turn to another card, B, and first of all we have Dr. Vogel's azaline plates. For some time past a great question at photo-meetings has been, what is azaline, and where can you get it? I have tried many places for it, but have never found it; so when the learned professor took out his patent some weeks ago, I thought I would find out now, but no; I am as much in the dark as ever. The doctor does not claim azaline, but simply all colours which readily fade when exposed to light.

However, it does not much matter what it is, for, if the plates I had from his agent here are a fair sample, you can easily see their colour-sensitive qualities are very poor indeed.

The next two examples are from plates of my own preparation, and I think, if you look carefully at them and compare them with the examples from Dixon's plates, underneath, you will say that they are in no way behind, and that in some things they are well ahead of, the commercial plates. The improvement is in the reds, and they give generally a better gradation.

The great trouble with them, however, is that they do not keep, and that you must pour on the bromide and ammonia first before the pyro, or else you will get silver stain; but for any who wish to have a really good plate giving good gradation, and if they can prepare them the night before requiring, the above will give good effects.

The formula stands thus—

Stock Solution.

Erythrosine	$1\frac{1}{2}$ drams
Ammonia 88°	1 dram
Alcohol	6 ozs
Nitrate of silver, 1 dram, converted into chloride with hydro-chloric acid, thoroughly washed, and re-dissolved in ammonia and water, bulk made up to	2 ozs.

To make up the bath take—

Stock Solution.

Erythrosine	1 dram.
Chloride sol.	20 mins
Liq. amm. 88°	1 dram
Water	6 ozs

Place this solution in any convenient vessel, and bathe your plate for one minute; then wash well under the tap, and put it aside to dry, which it will do in a few hours.

As the change in the nature of the plate does not take place until dry after treatment, it is not necessary to use a very weak light. I use orange-glass behind ground-glass, and have not found any fog from it. I use the same for development, only taking care that direct light does not fall off the plate until the image begins to appear, after which the plates seem to stand quite as much light as ordinary.

On card C, you will find examples from plates prepared with what is sold as Eosine B.

I am not chemist enough to know the difference between this and plain eosine, but you will see that plates prepared with an addition of silver have no orthochromatic effect.

Series D give examples of plates bathed in a solution of Magdala red, a dye mentioned by Dr. Vogel, and said to have good effect. I have not found it so.

Series E are examples of chlorophyl plates, the favourite process of Ives. I fancy there was something wrong about my chlorophyl, although it was from what is known as blue myrtle, but at any rate I got little effect from it.

And now we come to the last card F, and on it you will find prints from plates prepared with erythrosine plain, and with the addition of citrate silver; this last has no advantage over the formula given.

At the meeting of the Photographic Society of Great Britain, when this subject was discussed, the question was asked whether negative paper could be treated. I replied to the effect that it could; and I have here to-day a few orthochromatised stripping films, which any who care to see may examine.

Patent Intelligence.

Applications for Letters Patent.

2012. George Joseph Sershall, 371, Lodge Road, Hockley, Birmingham, for "Improvements in printing artificial skies by photography on to photographs."—9th February, 1887.

2042. John Rudolph Gotz, 433, Strand, London, W.C., for "Improvement in photographic cameras."—9th February, 1887.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

5086, of 1882. R. Brown and others. "Printing surfaces from gelatine reliefs."

Official Abstract of Accepted Complete Specifications.

Foxlee, 5205, 1886. "Gelatine image grained by dusting over with resin, resinous gums, bitumen, &c., afterwards removed by suitable solvents."

Specification Published.

3061. Benjamin Howarth Thwaite, F.C.S., 37, Victoria Street, Liverpool, in the County of Lancaster, Civil Engineer, for "An improved form of developing bath especially for large photographic prints."—4th March, 1886.

In this specification it appears that the vertical dipping bath is claimed; also the arrangement of several baths side by side. The mounting of a printing-frame over a vertical bath, looking-glass fashion, is also claimed.

Correspondence.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Dear Sir,—May the Committee again trespass upon your courtesy for space to notify photographers that the annual general meeting of members has been fixed for Monday evening next, February 21st, at 181a, Aldersgate Street, E.C. The chair will be taken at 8 p.m. by J. Traill Taylor. It is further desirable to mention that much useful work within the legitimate scope of such an Association has hitherto been but partially carried out, owing to the limited number of subscribers, whose position rendered it unlikely for them to tax the Society's resources. Suffering and misfortune have not been absent in circles photographic; but in the majority of cases that have fallen under the notice of the Committee, the essential qualification of membership was absent. The feeling prevailed that an annual payment of 10s. was beyond the capabilities of many whose earnings are often slender and variable, and that the Society would be of greater general benefit were subscriptions lowered in order to embrace all conditions of workers, viz., 2s. 6d. per annum. This innovation, which the Committee regard as a bold experiment, has now been brought about with the result of adding at least fifty members within a very short period.

Non-members are invited to be present and take part in the discussion, but members only are entitled to vote.

For the Committee,
H. Harland, Secretary.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 10th inst., A. L. Henderson in the chair.

J. Urie (Glasgow) exhibited samples of developed printing, made by means of an automatic printer. Some conversation upon toning then followed, wherein it transpired that the Chairman had altered and greatly improved an unsatisfactory specimen by re-toning in a gold and acetate bath slightly acidified with acetic acid. Methods of toning gelatine prints with the sulpho-cyanides were also spoken of favourably.

J. B. B. Wellington drew attention to a series of negatives and prints, showing both the camera and sensitometer effects produced on three different kinds of commercial plates, specially treated orthochromatically. The examples included daylight and gas illumination of a printed tablet rich in yellows and reds. He recommended a blue light for developing these plates.

Another illustration of reproducing from a coloured surface was shown by the Chairman, wherein a strongly marked advantage had been gained by using a slow plate (ordinary) in conjunction with a mixture of saffron and cochineal. He attributed the effect to diminished illumination rather than colour of the mixed dyes.

B. J. Edwards was of opinion that the best results were only secured when the special agent entered into combination with silver to form a silver salt, such as eosine, irrespective of colouring the film. It was generally conceded by the various speakers that the solar spectrum offered the most reliable test.

Edinburgh Photographic Society.

The fourth meeting of the current session was held on the 2nd of February, the President occupying the chair.

Five gentlemen were elected ordinary members, and four nominations were made for election in March.

William Crooke read a paper on "Photographic Portraiture" (see page 106), which elicited considerable discussion amongst the professional members.

J. M'Kean said the usual preference was for a north light in the studio when it could be got, but he was compelled to make use of a south light, and found it quite suitable except in brilliant sunshine.

F. Moffat thought the suggestion to use tissue paper as aid to the proper lighting of deep-set eyes a good idea.

J. Howie thought the idea of several preliminary sittings being given before a large work was undertaken ought to find favour and recommend itself. Photography was distinguished for a realism and truth which were not at all times picturesque; still these qualities were so valuable that they alone were sufficient to make our art ever hold its own.

H. Bibbs said he used at times as a reflector a screen covered with reddish blotting-paper. It conveyed a soft flesh-coloured light to the face.

W. T. Bashford said the hints given were very useful, but, like other good rules, had their exceptions. Each sitter requires to be considered on his own merits, and peculiar cases will run counter to all ordinary rules.

Mr. Forgan referred to Mr. Crooke's remarks upon the eye as conveying mainly the expression of the mind, so that, though the lower part of the face were hid, the eyes alone would tell what passion ruled at the moment. He thought that, expressive as the eyes were, it commonly needed all the features to unmistakably interpret mental emotions.

William Hume showed how a quite efficient enlarging apparatus could be improvised out of an ordinary packing box, by making a few simple adaptations. He also exhibited a number of gelatine-bromide enlargements made by it. The means by which the sensitised sheet was placed in the exact position desired, after focussing, was ingenious. Three drawing studs were placed in a triangular form as guides, and the paper placed quite up to them, and fixed there. Mr. Hume used a condensor, but no reflector.

Mr. **Forgan** recommended that a large portrait combination should always be preferred to a rapid rectilinear, in enlaging, because of the more general illumination it gave.

Mr. **Turnbull** said that when lamp flames were employed, they should be set edgewise to the lens; large spread flames did not do so well.

Mr. **Annan** and Mr. Craig-Christie each exhibited one photograph containing phautom images, but which was positively declared by their respective authors to be the production of a single exposure. A good deal of discussion ensued, and many explanations were offered, but nothing which was satisfactory—at least, to the producers.

The meeting was brought to a conclusion by a distribution of over seventy photographs by ballot to the members.

The first popular meeting of the present sessoin was held on 7th February, in Queen Street Hall, over a thousand persons being present. The lecture was by Andrew Pringle, the subject being the "Life of Sir Walter Scott, with a short notice of James Hogg." W. T. Bashford read the lecture, to allow of Mr. Pringle singing at intervals some of the well known songs of Scott and Hogg.

The transparencies which were used in illustration, being in several cases copies of old engraved portraits, were more interesting for what they represented than as pictures but in other instances some beautiful loch and other scenes were thrown on the screen.

Birmingham Photographic Society.

The usual fortnightly meeting was held at the Technical Schools, Bridge Street, on the 10th inst., E. H. **Jaques** in the chair. There was a very large attendance of members and friends. Frank Edwards was elected, and Messrs. Hoskins and Leeson nominated. The evening was devoted to the exhibition by the lantern of slides made by amateurs of the Society for prize given for the best slide shown on the screen. Fifteen slides were selected as the best, which were reserved for the final decision of the judging committee. Some very fine slides (not for competition) were also shown by Messrs. Barwell, Heaton, Pumphrey, and Welford. Altogether some two hundred slides were shown.

It was decided to promote similar exhibitions and competitions during the ensuing year.

The subject of next meeting will be "Developers and Rapidity."

Leicester and Leicestershire Photographic Society.

A **regular** meeting was held in the Mayor's Parlour on Feb. 9th. **George Bankart**, President, in the chair. An excellent attendance. Two members were proposed for ballot at next meeting, and B. Smith was elected.

T. S. **Taylor**, assisted by W. Taylor, then proceeded to give his paner on "Lenses," which was illustrated with several experiments and demonstrations, assisted with diagrams thrown on the screen by the oxyhydrogen light. Mr. Taylor first showed the effect of interposing a prism and prisms in the path of a ray of light, demonstrationg the deflection caused thereby, and with numerous diagrams he showed the various angles and foci determined by lenses of different shapes and densities, explaining the reason by practical examples, for using a combination of lenses composed of glass of different composition, as flint, crown, &c., and after showing practically the formation of portrait, rectilinear, and other combinations, he closed a remarkably instructive address by showing the various stages of manufacture from the rough glass to the finished lens, which, being a new experience to the members, was thoroughly appreciated and enjoyed.

Society of Amateur Photographers of New York.

A **meeting** was held on January 26th, President **Beach** in the chair.

The President exhibited a new form of camera manufactured by the Blair Camera Company, named the "Lucidograph," the peculiarity of which was that it was extremely compact and light, though large enough to take a 5 by [illegible] picture. When packed for carrying it resembled an ordinary mahogany box. One side being hinged, when turned out at right angles formed a brace for the folding bed rack, when the latter was let down in front. The frame carrying the lens front was adjustable for tilting the lens up or down, intended to answer for the double or single swing. The lens front was adjustable vertically. By releasing a certain lever at the back frame of the bellows, the entire bed rack could be quickly adjusted sideways for the purpose of performing the functions of the ordinary side swing. At the rear was the usual ground glass, held in position by two flat springs. The apparatus as a whole was well made and handsomely finished.

The President stated that Mr. Carbutt, of Philadelphia, who was present, had handed him a modification of an iron developer for lantern transparencies which he regarded as an improvement over anything he had previously tried, from the fact that it appeared to render the blacks in a transparency more transparent to transmitted light, and to add more snap and brilliancy to the transparency as a whole.

The following is Carbutt's improved formula for an iron developer for lantern slides.

A.—	Oxalate of potash	8 ounces
	Citric acid	60 grains
	Citrate of ammonia solution	2 ounces
	Water	30 „
B.—	Sulphate of iron	4 „
	Sulphuric acid	8 drops
	Water	32 ounces

C.—*Citrate of Ammonia Solution.*—Dissolve one ounce citric acid in five ounces of distilled water, add liquor of ammonia until a slip of red litmus paper just turns from the red, then add water to make the whole measure eight fluid ounces.

Developer.—Add one ounce of B to two ounces of A, add half ounce of water and three to six drops of a ten per cent. bromide solution.

Photographic Society of Ireland.

The usual monthly meeting was held on the 11th inst., in the Royal College of Science, Dublin, Mr. **Baker** in the chair.

Greenwood Pim exhibited a novel changing-bag, which was nothing more nor less than a light black india-rubber coat; this he buttoned down the front and laid on the table, buttons down, then doubled the sleeves and tucked them under, then with two little elastic bands—one round the neck and the other round the tail—both hands could be inserted light-tight as well as the box of plates and the dark slide, and the plates changed by feel alone.

Mr. **Meldon** also showed a bag which he was in the habit of using, and which had a small window of red stuff in one side, and a couple of eye-holes fitted in a face-piece which was held close to the face by an elastic band, so that plates could be changed by sight.

J. L. **Robinson** then read his paper entitled a "Week in Kent" (in our next), after which a number of photographs which he took on the excursion were passed through the lantern.

The report of the judges of the pictures sent in for the competition in work done last season was received, and the two medals were awarded—the one to Geo. Mansfield for his picture "Old Street in Salies, Basses Pyrenees," and the other to Dr. Brown for a "River Scene."

There were a very large number of pictures sent in for the competition.

Cheltenham Photographic Society.

The monthly meeting was held February 10, **Baynham Jones** in the chair.

The Secretary exhibited some prints on Liesegang's Aristo paper, stating that he had found a difficulty in toning them satisfactorily. He had first tried the ordinary borax bath, which produced no effect at all. The next batch were toned with a bath containing ammonium sulphocyanide and sodic phosphate, and the results were better, but not quite satisfactory.

Mr. Jones showed Vergara's slide for the Woodbury tissue, and a transparency printed on a Woodbury film. This was quite free from any appearance of granularity.

The Eastman Co. had sent for exhibition some specimens of enlargements on their bromide paper, and also some negatives taken on their new stripping paper. These latter were very much admired, being as clear as glass, and showing a marvellous amount of detail.

BIRKENHEAD PHOTOGRAPHIC ASSOCIATION

THE ordinary meeting was held on February 10, at the Free Public Library, J. A. FORREST in the chair.

Sylvester Parry, Alfred Matthews, and Charles B. Reader were elected members.

J. FORREST wished to draw the attention of members to the weekly reunions held on Wednesdays, at four o'clock, at the Merchants' Café, 25, Lord Street, Liverpool. These meetings have been in existence some time, are quite informal, and have proved themselves a valuable adjunct to the monthly meetings, where, with so many things always on the *tapis*, a great deal necessarily gets crowded out for want of time. He (Mr. Forrest) would be glad if the members of the Liverpool Association would co-operate with him in these "socials," and by their presence help to make them even more successful than they are; he wished to be permitted to extend the right hand of good fellowship to the Liverpool Association, and, if invitation was considered necessary, he invited them most heartily, as he felt the two Associations should fraternise more than they did, and especially so with regard to the excursions, which he thought might be arranged for the mutual pleasure and convenience of all.

After some discussion, it was resolved that silver and bronze medals shall be awarded at the next competition in lieu of the prizes of prints hitherto offered, as it was felt the medals would act as an incentive, and induce members to take part more largely in the various competitions.

P. LANGE exhibited an excellent 12 by 10 enlargement from a half-plate negative, printed in platinotype, of two beagles, which were greatly admired.

H. H. WILLIAMS exhibited some whole-plate Woodbury tissue negatives and prints therefrom; in the latter there was no perceptible trace of granularity whatever.

The SECRETARY also showed a large number of prints taken during a ten days' holiday in the Mourne Mountains, North of Ireland, last Christmas, which helped to illustrate some of the beauties of this photographically forsaken part.

A. W. BEER then read his paper, "A Holiday in the North Riding; or, On the Trail of the Artists." The paper was illustrated with over a hundred views reduced from 10 by 8 negatives, many of them most artistically coloured, which increased their beauty considerably.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

THE usual bi-monthly meeting was held on February 15th, J. TRAILL TAYLOR, President, in the chair.

The following gentlemen were nominated by the Council as honorary members:—W. Ackland, W. Bedford, E. Dunmore, E. W. Foxlee, D. W. Hill, J. Martin, and G. Shadbolt; and H. Dimmock and H. Imray as ordinary members.

Mr. TAYLOR, vacating the chair, which was taken by A. Mackie. Vice-President, then delivered a lecture on the characteristics of the photographic lenses in everyday use. Commencing with the portrait lens, he explained the great influence of the back combination not alone in conferring intensity of the image by shortening the focus, but especially in flattening the field, showing by what means a round field could, by a slight modification, be rendered flat. Such defects as astigmatism, and not working to focus, were treated of, and remedial measures indicated, together with the best position for placing the diaphragm in order to secure certain ends. The employment of this lens for lantern projection was dwelt upon at some length, and the conditions for obtaining the best marginal definition on a flat field pointed out. Modern single achromatic landscape lenses next claimed attention, and it was shown that for certain classes of large heads these would prove very useful. The conditions under which such lenses would give a soft definition coupled with rapidity of action were shown, and an explanation given of the means whereby the front lens of a portrait combination could be used alone for portraits of large dimensions as well as for landscapes. The class of doublet lenses known as rapids claimed a large portion of the speaker's attention during his discourse. He explained by what means the flattest possible field could be obtained while using a large aperture, and dwelt at some length on the flare spot in the centre of the field, to which so many of these lenses were liable when employed out of doors with a small stop, explaining cause of this fault and showing the means by which it could be cured without affecting the working of the lens otherwise, and further explaining by what means the rapid doublet could be converted into a wide-angle lens. But, he said, while a good rapid doublet might be made to embrace a wide-angle by having a supplementary short mount, an originally wide-angle lens could not be converted into one working with great rapidity. The subject of comparing and testing lenses, the employment of the single parts of compound lenses for landscapes at long ranges, the care of lenses, conjugate foci, and other topics of a practical nature, including that of the best form of mounting lenses, all received their meed of attention during the discourse, which lasted over an hour, and during which several lenses of various forms were exhibited.

F. W. COX believed that many years ago Mr. Taylor showed at the Photographic Society of Scotland a lens he had made to give diffusion of focus at will, and asked whether there was any lens made that would give such diffusion of focus. He thought such an one would give very artistic effects.

E. DUNMORE had taken pictures with a Dallmeyer's portrait lens in which this quality could be obtained by separating the back combination.

J. T. CHINN asked whether there was any rule for fixing the distance of the stop from the lens in single lenses.

Mr. TAYLOR said that no rule could be laid down. The best position of the stop could best be fixed by a system of trial and error.

Dr. LINDSAY-JOHNSON asked why some makers made the lenses of their wide-angle rectilinears very small, while others made them so much larger.

Mr. TAYLOR explained and demonstrated that in the former case the same results are obtained by using very thick lenses, which in the latter was obtained by using thin ones of larger diameter.

GLASGOW PHOTOGRAPHIC ASSOCIATION.

AN ordinary meeting of the above Association was held on Thursday, February 3, in the South Glasgow Exhibition.

A number of Eastman prints by Nadar, Paris, and sent to the meeting by G. Mason and Co., Glasgow, were passed round, a conversation taking place on the merits of the Eastman and kindred argentic papers.

J. URIE said that this process of printing was sure to come to the front. It had three distinct qualifications over albumenised paper, namely, it was cheaper, it was quicker in printing, and it was permanent. In the pictures before them he thought, however, the deep shadows might have had more of an engraving black about them, and this could have been got by having the shadows in the negative clear glass.

J. PATON did not know that it would have improved the pictures to have them blacker in the shadows. He had always found that they had a much softer and pleasanter effect when the shadows were not too dark.

J. URIE said he did not mean that the picture should be hard, but what he wished to show was that the blacks in these pictures were dull and flat, and what an artist would do were he working up one of them would be to brush over the shadows with gum or varnish, so as to make them more brilliant. This, however, that an artist would do, could all be done by having a proper negative and developing carefully.

G. BELL said it was wonderful how good an enlargement could be produced on this paper from a very inferior negative. He had occasion to take a group rather late in the afternoon, when most of the light had gone; instead of wasting a large plate, as he knew it would be useless to attempt a large size, he used a quarter-plate; the resulting negative proved almost useless, giving an exceedingly poor print on albumenised paper; yet this same negative, when placed in the lantern, yielded, on argentic paper, an extremely good 18 by 14 enlargement.

After some further conversation, a vote of thanks was given G. Mason and Co. for allowing the members an opportunity of examining these beautiful pictures.

The CHAIRMAN then asked the Secretary to read his paper, entitled "Some Photographic Illustrations from the Works of O. W. Holmes."

Talk in the Studio.

ISOCHROMATIC PHOTOGRAPHY.—From John Parry, of the Ebbw Vale Iron Works, we have received a note of his experience. He says:—"I have been experimenting with plates stained with eosin, and I find, with J. B. B. Wellington, that mere staining with eosin has little or no effect on the sensibility of the plate to green and yellow. On the contrary, when silver nitrate is added the plates become orthochromatic. Much depends, however, on the quantity of silver nitrate used. 1—Plates stained with 200 water containing 0 010 grains eosin, ·4 c.c. of ammonia, and ·30 grains silver nitrate invariably fog; 2—Same bath, containing ·15 grains silver nitrate, fog slightly; 3—with ·075 grains silver nitrate, do not fog, and are sensitive to green; 4—·0375 grains silver nitrate, not so sensitive to green, &c., as No. 3, requires forcing with ammonia to bring out the part of the spectrum up to the wave length 5600. It seems to me there is an opening in this direction for artistic landscape work. According to the prevailing tints, for instance, if it is judged that blue is the predominant colour, a plate sensitive to green should be used; on the contrary, if green predominates, one less sensitive to green should be used. No. 3 would suit the latter, and No. 4 the former.

CHEMICAL CHANGES PRODUCED BY SUNLIGHT. By E. Duclaux.—Many organic compounds are affected by solar radiation in the same way as by microbes, the products of the change being water and carbonic anhydride, with other substances which are relatively stable in the conditions under which they are produced, and are identical with the products of the action of microbes. Cane-sugar in neutral or alkaline solution is not affected by prolonged exposure to sunlight, but if slightly acidified even with an organic acid it is readily inverted by solar radiation. The solution of invert sugar undergoes no further change so long as it remains acid, but if made alkaline the glucose is rapidly decomposed with formation of water, carbonic anhydride, oxalic, formic, and acetic acids, and about 3 per cent. of alcohol. A similar change takes place, although less rapidly, out of contact with the air, and hence it is evident that the decomposition is due to internal combustion. Lactose and lactates also yield alcohol under similar conditions. The exact nature of the change in any case is modified by the nature of the source from which oxygen is absorbed (air, salts of platinum, gold, mercury); but the chief products are practically the same from all substances. These products are alcohol, oxalic acid, acids of the acetic series, leucine, carbamide, carbonic, anhydride, water, &c. Certain differences are, however, observed. Tartaric acid gives aldehyde in place of alcohol, and the alcohols, if oxidation is regular, tend to produce the corresponding acid of the acetic series.—*Journal Chemical Society.*

PHOTOGRAPHIC CLUB.—The discussion at the next meeting will be on "Lantern Matters." This is a lantern night. Visitors are invited.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

H. W. T.—Probably hypo solution has been spilled on the floor, and dust contaminated with the salt has settled on the paper.

F. B. G.—1. It is convenient to make up a solution containing one grain of the salt to a drachm of water, and add this to the toning bath as required. The above solution keeps well in a stoppered bottle. 2. Possible, but not a very convenient course.

P. H. C.—Try J. J. Atkinson, of Liverpool; the address is Manchester Street.

AMATEUR.—The wet collodion process is employed for the ordinary glass positives. Obtain the "Principles and Practice of Photography," by J. Hughes. Price 1/-, published by Werge, 11A, Berner's Street, Oxford Street, W.

S. H.—Use Indian-ink or Prussian blue water-colour, very carefully applied with the tip of a fine sable pencil.

G. G. MITCHELL.—Unfortunately too late for the addition.

DEALBRETTE.—1. Those you mention are as good as any we know of. 2. Ebonite from the Silvertown Co., 100, Cannon Street, E.C.

A. SCHULTZE.—Photo. Printing Co., 62, Basinghall Street, E.C.

ARGENT.—It pleases us very much indeed, and will probably please a sufficient number of the public to make it worth while to use it as you propose. The word "artistic" in such a phrase as you quote means absolutely nothing, except that the speaker cannot express an idea, so he uses a word instead. Try the effect of printing the head under a circular mask with an opening 2¼ inches in diameter; then cover the printed part, and expose till the ground has about the same tint as the lightest part of the left sleeve.

HY. ECKHARDT.—The suggestion is a very good one, but just at present we cannot see a way to carrying it out.

H. B. G.—1. Thin plates of tinned iron (tin plate) coated with a bituminous varnish. 2. Under such circumstances there will be no silver in the solution, but all of it will be in the black deposit. 3. Perchloride of iron is to be preferred.

G. D. BAKER.—No information beyond that to which you refer has been published; but we hope shortly to be in a position to give further particulars.

A. ROBINSON.—See Waterhouse's series of articles on photo-lithography, which were commenced on page 482 of our volume for 1882, and which terminated in our volume for 1885. If you are generally experienced in photo-lithography, the articles on pages 413 and 444 of the last-mentioned volume may be sufficient for your purpose. There is no English book dealing with the subject in detail. Husnik's "Reproductions-Photographie" is a useful book in German; Hartleben, of Leipzig, publishes it, and the cost is only a few shillings.

H. T. L. HAAKMAN.—1. The author expressly mentions that although the amount of gelatine is small, it is sufficient for a print having a similar appearance to a platinotype. It sets readily enough if Heinrich's gelatine is used. 2. The ammonium chloride has been omitted, 6½ grains being required.

Photographs Registered.

J. D. HANNAH (Islington, Shrewsbury)—Photo. entitled "Beauty and the Beast."

WILLIAMS & Co. (Shrewsbury)—Photo. Group of the Mayor, Councillors, and Officials of Shrewsbury.

J. STABB (134, Kensington Park Road, Bayswater)—2 Photos. of Duchy Hotel.

THOS. BALL (Broughton, Manchester)—Photo. of Bishop of Manchester and Friends.

H. B. DAVIS & SON (Birmingham)—Photo. of Jem Mace.

G. A. DEAN (Douglas, I. of Man)—Photo. of Old Clock at Castle Rushen.

MARSHALL WANE (Edinbro')—Photo of Duke of Sutherland; Photo. Group, Prince and Princess of Wales and three Daughters; Photo. Group, Princess of Wales and two Daughters.

A. NEWTON (Leicester)—4 Photos. of Safes after a fire at Leicester.

JONATHAN GREGOIRE (353, Mosely Street, Birmingham)—Photo. of Joseph S. Gamgee.

W. P. MARSH (Bognor)—4 Photos. of the "Matilda" Sailing Vessel; Photo. of L. C. & D. R. Co's Steamer, "Victoria."

J. C. GILBERT (17, Ingestre Road, Stafford)—Photo. of "Bend Or"; Photo. of "Ormonde"; Photo. of the mares Lilly Agnes and Jessie Agnes and her foals; 2 Photos. of "Ormonde," with Archer mounted.

GEORGE MOLD (Banbury)—Photo. Interior of St. Mary's Church, Banbury.

F. K. BINDLE (73, High Street, Dartford)—Photo. of Mr. T. Alexander.

G. T. JONES (9, Surbiton Park Terrace, Kingston-on-Thames)—Photo. Group of Dogs.

E. HAWKINS & Co. (Brighton)—3 Photos. of the late F. Archer.

Mr. SUTCLIFFE (Whitby)—Photo Group of Boys bathing.

E DEBENHAM (Torquay) Photo. of Lord Mount Temple.

H. HALHED (Canterbury)—Photo. of Dr. Payne Smith, Dean of Canterbury.

O. P. RICHARDS (Duke Street, Barrow-in-Furness)—Photo. entitled "This Little Pig went to Market."

D. HEDGES (Lytham)—4 Photos. of Lytham Life-Boat and Crew.

J. MOLL (High Street, Chatham)—2 Photos of Prince Leiningen; 2 Photos. of Princess Leiningen; 2 Photos. of Princess of Leiningen; 1 Photo. Rear-Admiral Watson.

The Photographic News.

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For Advertisement Scale see page v.

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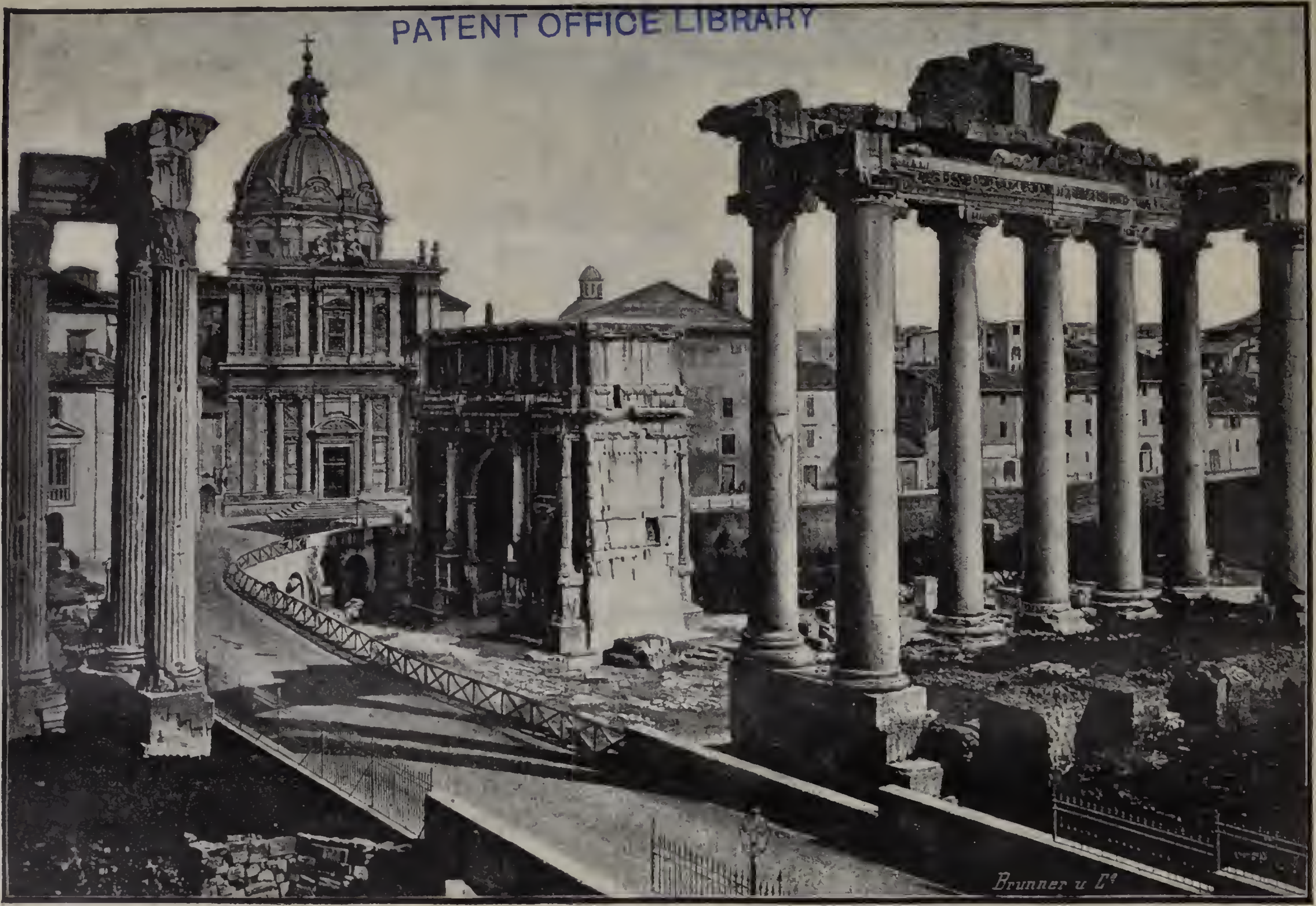

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PRINTS BY THE COLLODIO-CHLORIDE PROCESS.

THE manipulations of toning and transferring collodio-chloride prints from paper to glass, demonstrated by J. Hubert before the London and Provincial Photographic Association on the 17th inst., was another forcible illustration, if such were required, that with care and judgment as perfect results can be attained with the process as at any time have been achieved with albumenised paper, whilst the comparative ease by which collodion prints can be transferred from one support to that of another is an advantage scarcely to be over-estimated. The precise formula for coating the paper quoted by the demonstrator is that adopted by Dr. Liesegang, and, with one exception, all the prints toned by J. Hubert were of commercial preparation, in which the lithium chloride salt was employed, together with an equal proportion of tartaric acid, the pyroxiline used being prepared at a moderately high temperature. There is no special feature, however, about the process, details of which have already been described in these pages many times, since the introduction of this method of printing by the late George Wharton Simpson nearly a quarter of a century ago. Soon after the announcement was made to the world, experimenters were busy with improvements and adaptations, among whom may be noted Swan, Bovey, Palmer, Prestwich, and other practical workers. Paper and opal plates coated with the emulsion then became articles of commerce in this country, and for a time were largely employed. The process, however, gradually fell into disuse, or, at all events, partially so, and the manufacture consequently ceased; but it is tolerably certain that were the demand again created, it would be quickly met. If J. Hubert or others can rouse an enthusiasm over this beautiful process among amateurs of to-day, we may be sure that our energetic business men will recommence the manufacture under conditions the most favourable, and the material will no doubt be obtainable at prices that may possibly exercise a restricting influence upon the operations of those gentlemen who not long since formed a ring to increase the cost of albumenised paper.

The essential details of the process are too familiar to our readers to necessitate more than a brief survey; moreover, an abstract of the paper read at the meeting appears on page 123. Collodion emulsion, prepared according to published formula (see page 203 current YEAR-BOOK, or back volumes of the NEWS), is flowed over a specially-prepared surface. For paper prints, a kind of enamel paper, surfaced with barium sulphate, emulsified with gelatine, and slightly tinted with an aniline dye, is used. When the sensitive emulsion is dry, it is printed under a negative, toned, fixed, and washed like albumen prints. More care is required in handling than is requisite with the latter, or with similar sensitive salts emulsified in gelatine, and spread on paper. Perhaps the most interesting part of the demonstration on Thursday evening consisted in the modification of coating a thickly-gummed paper with sensitive emulsion for the purposes of stripping. When dry, this gum paper is printed more or less deeply as occasion may require; for instance, light prints are suitable for lantern work, deep impressions answering well for the reproduction of negatives. For these purposes, the prints may be squeegeed upon glass, porcelain, or other surfaces which have been prepared by coating with a substratum, and, in the course of a very short time, required for softening the gum, the paper support can be removed, together with all excess of soluble gum, by the mere application of cold water. In order to overcome objections which might be raised to the reversal of an image, a method of double transfer was shown, in which the gummed paper image was attached to a second temporary support similar to that employed in carbon printing, and from this re-transferred to its final support. It should be added that a sulpho-cyanide toning bath was employed on this occasion, and the exception mentioned in the early part of this article referred to a print prepared by Mr. Hubert from the formula he gave. This print, unlike the others, curled very much under the influence of aqueous solutions; but, discussion being postponed until the following meeting, the reason for this peculiarity was not elucidated.

INFRINGEMENT OF COPYRIGHT IN A PHOTOGRAPHIC PORTRAIT.

THE case of Hannah *v.* the *Guardian* newspaper Co., decided at Shrewsbury on the 10th instant, is one which is particularly instructive, as it clearly indicates the main circumstance which may render a registration invalid. We take the following particulars from the *Shrewsbury Chronicle.*

Mr. Hannah, a photographer, of Shrewsbury, sued the *Guardian* Newspaper Company for the recovery of damages for the infringement of a copyright of a photograph of Mr. James Watson, M.P., which was taken by the plaintiff, and copies of which were published afterwards in one of the defendants' newspapers.—Mr. R. H. Spearman was for the plaintiff; and Mr. A. R. Jelf, Q.C., and Mr. A. T. Ram, for the defendants.

Mr. Spearman said the plaintiff was a photographer of the town, and defendants published *Eddowes's Shrewsbury Journal.* At the end of 1885 Mr. Watson was elected member of Parliament for the borough of Shrewsbury, and Mr. Hannah naturally thought that many persons would be glad to possess a portrait of that gentleman. He accordingly made arrangements with Mr. Watson to take a photograph, which was done. After it was duly registered the plaintiff sent copies to Mr. Watson and to various shops for sale. That was in the early part of last year, and on April 28th the paper named issued a special number, which was announced in the little pink handbill he produced, the publishing of a portrait being mentioned. Mr. Hannah purchased a copy, and was surprised to find that the portrait, in the shape of a wood cut, was a copy of the photo taken by him, not a word having been said to him about it before hand. There was a clear infringement of copyright, and naturally enough Mr. Hannah consulted his solicitor, and he now came before them and asked them to say that he was entitled to damages. Mr. Spearman then referred to the statute to show that when a photographer who took a photograph and received no remuneration, and where he still held the negative, as under the circumstances in this case, he was entitled to the copyright, and it should not be infringed by any person. The defendants said virtually that the plaintiff had no right to the copyright, and alleged that what they did was with Mr. Watson's consent. They had no consent, and even if they had it was no answer to that action, for Mr. Watson had no right to give them leave to copy this particular photograph. The penalty was a sum not exceeding that of £10 for each copy, but he did not wish to ask for damages for every copy of the paper issued. Mr. Hannah merely came there to protect his rights, and to recoup him for the loss he had sustained. The plaintiff had, no doubt, suffered by the action of the defendants, who sought to benefit their paper by the publishing of the portrait in their columns.

Mr. Jelf, after a consultation with Mr. Spearman, said there was a question of law and a question of fact involved in the case. The question of law was whether, under section 6, 25 and 26 Victoria, chap. 28, a number of copies of a paper issued all in one day were to be considered as one publication, or whether each paper was a separate one. The other question was whether the plaintiff was the proprietor of the photograph. His friend and he had agreed upon two figures as to damages—one if his Lordship thought his friend's contention was right, and one if he were wrong, as to the point of law.

The Judge: Is there much difference?

Mr. Jelf: Yes, my Lord.

After some conversation one sum was agreed upon at the suggestion of his Lordship, but it was not stated; the question of law not to be raised. The following evidence as to the facts was then called:—

The Plaintiff said: I am a photographer in Shrewsbury. I have been in business here since 1875. In January last year I took a photograph of Mr. Watson. I cannot give the date, as I have not Mr. Watson's letter. He came according to appointment, and I took four negatives, but only finished one. I afterwards sent proofs to Mr. Watson, and Mr. Watson called with them and left them. I was not in at the time. I printed off several, and this is a copy. They were printed the same week that they were registered—in April. When I printed it I registered it at Stationers' Hall (date, April 13, 1886), and received the usual acknowledgment. I then stamped the photos "Copyright." I did not issue any before that. I afterwards sent four copies to Mr. Watson; that was on the 21st April. They were marked "Copyright. On the 28th April *Eddowe's Journal* had a copy of it as a wood-cut.

Mr. Spearman said it was admitted that the wood-cut was from a photo, which had the word "copyright" upon it, and that it was published by the defendants.

Witness proceeding said: I afterwards consulted my solicitor, and on the 9th day of May a writ was issued. There was no arrangement as to payment with Mr. Watson. The sitting was asked as a favour, and granted as such. I applied to Mr. Watson by letter, but have not got a copy. Mr. Watson replied and came according to appointment. He was photographed, but said he had had so many done already he did not need any himself, but he came to do me a favour. I have never parted with or sold the negative of the photo, and I have never received any money from Mr. Watson or any consideration whatever for the copies sent him. Cross-examined by Mr. Jelf: I have a studio, but no shop. I decidedly never thought of Mr. Watson paying me anything for the photo. None of the photos were printed in January. I cannot say if any were printed before the middle of January. I say decidedly that I did not circulate copies before they were registered. I saw the handbill, when it was issued, about the publication of the picture in the *Journal*. The handbill appeared with the papers. I only received it with the paper. I will swear I did not see it before the paper was issued. I recognised the infringement at once, and was surprised to see it in the paper. I wrote to Mr. Watson to ask how many copies he would accept. I have no copies of any of the letters, so far as I know, but one. Mr. Watson wrote for a dozen copies of the photo, and asked for the bill. I wrote again asking Mr. Watson to accept copies, and stating that I never expected to receive any remuneration. Mr. Watson wrote on the 22nd April, and I replied on 20th May. I had written before, but did not post the letter. I tore it up and wrote another. I have a copy of the letter of 20th May. I cannot say why I tore up the first letter and wrote another of which I kept a copy. I tore up the first before the 28th, and not on the day I wrote the second. I saw the woodcut on the 28th, but that did not induce me to tear up the letter I wrote first. The letters were not differently worded. I might have kept the letter for a month before I destroyed it. I destroyed it because the date was wrong, and that was the only reason. It was written before the 27th, certainly. I will swear that I did not alter my letter because I thought I had a chance of getting more money out of the defendants than out of Mr. Watson.

Mr. Jelf, addressing the jury in defence, said he was not going to address the jury at all on the question of damages, and it was not necessary to go into the question as to whether there was any real damage or not. He submitted that if there had been any infringement of copyright, it was perfectly innocent and unintentional. Surely, in such a case, it was of the utmost importance to see whether or not the account the plaintiff gave was that of a man who was straightforward, who had not changed his front, but who had all along maintained one position. The hand-bill went out about the 7th April—three weeks before the 28th, when the woodcut itself was published—and in ample time for the plaintiff to set to work then and register his photograph. Amongst other things they had to consider, then, was whether the plaintiff's conduct in the matter had been straightforward. The defendants sent a man to Berwick, who got all the information required, and a picture was obtained of the hall. Mr. Watson had left word that all required information was to be given; and there was a photograph of Mr. Watson, which he could have had; but he came away without it. A copy was therefore obtained in the town, and the word "copyright" was upon it; but, having had the consent of Mr. Watson, the defendants thought they had full right to publish it, and they did so. Let them, however, mark the conduct of the plaintiff. Did he act in a *bonâ-fide* manner throughout, or did he, when he found the portrait was published, or about to be, come to the conclusion that he might get more money out of the Company than out of Mr. Watson? If the latter, of course it became of the utmost importance to him to tear up the document which told against him.

W. B. Harvey, reporter, said in April last he went to see Mr. Watson at Berwick, and informed him that it was desired to publish a portrait of him in the *Journal*, which he agreed to.

Francis Leach: I am the editor of this paper. The hand-bill was issued early in April. It would be three weeks before or about. I should say no copies of this bill would be issued with the papers themselves on the 28th, but any copies not circulated might perhaps be put in the papers by the publisher.

James Watson, M.P., who was called by Mr. Jelf, said: I am M.P. for Shrewsbury. I remember receiving a letter from Mr. Hannah, asking me to sit for my portrait. I have destroyed that letter. It was somewhat more than a year ago. I called at the studio, and Mr. Hannah took the photographs in four positions. He sent me a few prints of the four negatives when he had finished his work. I told him to send me a few of them. I mentioned that at the first sitting. He showed me the negatives at the time. He had a very good one. I believe I told him to send me six or half-a-score. I think he replied that he should make no charge. I remember Mr. Sarl calling upon me at my London house in May or June. I am clear Mr. Hannah said at the time he would make no charge.

Mr. Jelf: Have you always said that?

The Judge: Now, really, you must bear in mind that you are cross-examining your own witness.

Witness continuing: I made no bargain or intimation that he would accept payment. I wrote the letter dated the 21st of April, in which I asked him to forward the photographs at his convenience. I think I have only received one answer from him since. In answer to Mr. Spearman the witness stated that he wrote a letter [produced] dated May 28th, in which he said that as Mr. Hannah had so kindly *renewed* his request for him to accept the photographs, he would accept.—His Lordship drew Mr. Jelf's attention to the word "renewed," and Mr. Jelf said after that letter he should advise his clients to abandon the defence.

His Lordship then directed the jury to return a verdict that the copyright belonged to the plaintiff.

The defendants having entered into an agreement not to publish any more copies of the paper in which the portrait appeared, he entered judgment for the plaintiff with costs. It has since transpired that the amount of damages for the plaintiff agreed upon between counsel was £20.

CARBON PRINTING FOR AMATEURS.

The question of single or double transfer is naturally an important one to the worker of the carbon process. The advantage of the single transfer process lies not only in the comparatively small amount of labour which it involves, but also in the fact that this risk of loss by damage of any kind to the print during manipulation is far less than with the double transfer process, there being, in fact, scarcely any risk of loss in the case of single transfer, and in the case of double transfer the chance of loss, if it be numerically small, is yet several times that occurring in the case of single transfers. That the single transfer is a process greatly preferred to the double by the most skilled workers is proved by the fact that most, if not all, workers on a large scale prefer, where they have the making of the negatives themselves, to produce reversed negatives, rather than to use double transfers; although the production of a reversed negative involves additional work.

It is a very much disputed point to what extent reversal is admissible in portraiture. It is pointed out by those who will not hear of reversal, that few people have the two sides of their faces exactly alike, that the hair is commonly parted on one side, and so forth.

To these we would advise an experiment. Let a dozen or so of portraits—all of people known to the individual who sees them—be shown to any one, some reversed, others not, and see if, without being specially asked to do so, he will discover the fact that some are reversed and some not, or if he will notice anything apparently wrong—without knowing what it is—in the case of the reversed prints.

In the case of a reversed portrait the portrayed individual sees himself in the portrait in the only way in which he commonly sees himself, namely "reversed," as in a mirror! And it may be argued that this sitter is the person whom it is most desirable to please.

Almost any body which is impervious to water may act the part of a temporary support, the carbon tissue adhering to the support by atmospheric pressure—and probably afterwards by cohesion—if brought into contact with it after the gelatine has commenced to swell, but has not swelled to the full extent. It is desirable that the support be light in colour, so that the process of development may be carefully watched. The substances actually in common use for temporary supports are zinc sheets, opal glass plates, &c., and paper coated with certain varnishes or preparations so as to render it practically imperviable to water. A support of the last mentioned kind is commonly known as Sawyer's flexible support, and has various ad-vantages. It is only necessary to rub it some time before it is required with a solution of wax and resin in turpentine. The print is then immersed into cold water. The tissue first curls inwards; this indicates the swelling of the paper. It then straightens itself out; this indicates that the comparatively slow process of the swelling of the gelatine has overtaken that of the swelling of the paper. At this moment the two films are drawn out of the water together and are brought into close contact by the aid of the squeegee. They remain in contact between blotting boards for any time between ten minutes and half-an-hour, when they are ready for development by simply placing them in warm water. It is possible by using a flexible support to transfer images, unreversed, to rigid supports, and this even when these are not quite flat.

The prints, after development and treatment with alum, are simply brought into contact—by the aid of the squeegee again—with the final support, and are hung up to dry, when they strip with the utmost readiness.

An improvement has recently been made by the Autotype Company in their final support. It used to consist of a film of semi-insoluble gelatine on paper. It was necessary before using it to place it in water of such a temperature as would make the surface slimey to the touch. The film became more and more insoluble by keeping, and as a consequence there never was any certainty as to what temperature of water might be required. The new tissue is made of soluble gelatine, and is placed, before development operations commence, in a two per cent. solution of common alum. It is then ready when it is required, either cold or tepid water being used in bringing it into contact with the film on the temporary support.

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.C.S.,*

Senior Assistant Lecturer on Chemistry and Lecturer on Photography in the Yorkshire College, Leeds.

Action of Dyes on Sensitive Plates.—In 1873 Dr. Vogel, who is well known by his photographic researches, discovered that the addition of certain dyes to a sensitized collodion plate increased the sensitiveness of the plate to yellow or yellowish-green to a remarkable extent. This effect was especially well marked in the case of eosin and other dyes of the same group. Vogel's observations were confirmed by Waterhouse, Carey Lea, Abney, Becquerel, and others, and were put into practice by Ducos du Hauron, who devised a process of chromo-lithography in which the different stones were prepared by photographic methods.

Shortly after the discovery of these facts the gelatino-bromide process was introduced, and for a time the development of this process absorbed the whole energies of photographic investigators. Moreover, the first attempts to apply dyes to gelatine plates met with little success.

In 1879 Ives of Philadelphia introduced the first really successful practical process, which still remains one of the best. It consists in staining a collodio-bromide emulsion plate with an alcoholic solution of chlorophyll, the green colouring matter of leaves, which was first used as a sensitiser by Becquerel.

In 1882-3 Attout and Clayton patented in France and England † a process of staining gelatino-bromide plates with eosin, whereby they were made sensitive to yellow. Schumann confirmed the advantages resulting from the use of eosin, and somewhat later Vogel introduced plates stained with "azalin," which is said to be a mixture of quinoline blue, or cyanin, with quinoline red.

The question was very fully investigated by Dr. Eder, of Vienna, to whose "Ausführliches Handbuch der Photographie" I am much indebted. Eder has since continued his researches, and similar experiments have been made by other investigators, some of whom have already been mentioned.

Dr. Eder examined the effect of more than 140 dyes in increasing the sensitiveness of gelatino-bromide plates to different parts of the spectrum, and the experiments were made under a variety of conditions, including several different degrees of concentration of the dyes, and different times of exposure. Only a very few dyes were found to exert any appreciable effect, and even with the majority of these the effect was very small. The results obtained are represented by curves (fig. 3.) in the manner already explained. It is important to distinguish between the effect of the dye on the *general* sensitiveness of the plate, and its effect on the relative sensitiveness for particular

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Continued from page 82.

* Continued from page 67.

† English Specification, No. 101, 1883.

rays, such as yellow, orange, or red. As a rule the addition of a dye very considerably reduces the sensitiveness to blue, and therefore the total sensitiveness of the plate; rose Bengal, for example, reduces the sensitiveness to blue to one-third, or even one-sixth of its original value.

Violet dyes, such as Hofmann's violet, methyl violet, &c., diminish the general sensitiveness, but increase the relative sensitiveness to orange, yellow, and green, the maximum effect corresponding with a point in the spectrum situated between D and C, but somewhat nearer D (No. 1, fig. 3).

Green dyes, such as methyl green, benzaldehyde green, and acid green increase the sensitiveness to red, the maximum effect corresponding with the position of the line C, but the effect is only observed with brilliant illumination, and when great attention is paid to the degree of concentration of the dye solution. Even under the most favourable circumstances the effect is not very clearly marked (No. 2, fig. 3). Iodine green, however, deserves special mention. It diminishes the general sensitiveness of the plate to a marked extent, but increases the sensitiveness to orange and red, the maximum effect being observed between D and C; and it sensitises for the extreme red to a greater extent than any other dye that was examined (No. 3, fig. 3).

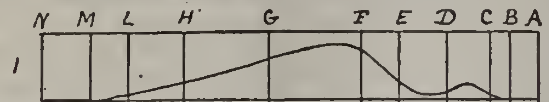

Fig 3*.

1, Violets; 2, greens; 3, iodine green; 4, cyanin; 5, eosin; 6, rose Bengal with ammonia; 7, chrysanilin; 8, gelatino-chloride with eosin; 9, eosin and cyanin; 10, eosin with yellow screen.

Cyanin (quinoline blue) is an excellent sensitiser for orange and red, a fact which was observed simultaneously by Schumann and by Eder. Different commercial varieties behave similarly, but the ordinary variety, iodocyanin, gives the best results. The general sensitiveness is diminished, but the sensitiveness to orange is increased a hundred-fold, the maximum effect corresponding with a point almost exactly halfway between D and C (No. 4, fig. 3). The effect of the cyanin is increased by the simultaneous addition of ammonia.

Eosin, which was the first dye actually used for the purpose, sensitises for yellowish green and yellow. The maximum effect is situated between E and D, and is nearer D the bluer the shade of the dye. The effect is increased by the simultaneous addition of ammonia. Other dyes of the eosin group exert a similar action, though not to the same extent (No. 5, fig. 3).

Erythrosin, which has been so strongly recommended by Mallman and Scolik, is closely related to eosin, but since the shade of the dye is bluer, the position of maximum sensitising action lies nearer D than in the case of ordinary eosin.

Naphthol blue possesses the unique property of rendering a plate sensitive to all parts of the spectrum,* the sensitiveness extending without a break from wave-length 3,600, which is just beyond the extreme violet, to wave-length 7,600, which is at the termination of the visible red. In other words, a gelatino-bromide plate treated with this dye has the greatest sensitiveness of all known photographic preparations to rays of different wave-lengths.

Rosaniline sensitises for greenish yellow and yellow; Magdala red for yellow; chrysaniline for green and greenish yellow.

It will be observed that in every case except chrysaniline and naphthol blue there is a point of minimum action between the two points of maximum action, as indicated by the descent of the curve.

Many dyes—such as corallin, resorcinol blue, and acid magenta—do not increase the sensitiveness to yellow and red, but very considerably reduce the sensitiveness to the violet and ultra-violet rays, and thus diminish the total sensitiveness of the plate, whilst they increase the relative effect of the blue rays. This action is most distinct when the exposure is short, and is very strongly marked in the case of chrysaniline (fig. 3, No. 7).

Other dyes which were examined gave no very marked results, the sensitising action being comparatively feeble, and in many cases barely perceptible.

Effect of the Presence of Silver Iodide.—The action of dyes on silver gelatino-bromide is not materially affected by the presence of silver iodide, provided that the latter does not exceed three per cent., but with a larger proportion than five per cent. the sensitising action of the dye is diminished.

Effect of Dyes on Silver Chloride.—With silver gelatino-chloride the action of dyes is very much the same as with the bromide. When eosin is used, the sensitiveness to the violet and ultra-violet is so much reduced, and that to greenish-yellow so much increased, that if the exposure is prolonged, the effect of the greenish-yellow rays exceeds that of the violet and ultra-violet rays (fig 3, No. 8).

From these facts it will be gathered that only a very few dyes have any practical value as sensitizing agents. The particular dye to be used will depend upon circumstances, and mainly upon the colour to which the plate must be rendered sensitive. Naphthol-blue sensitises for all colours. Iodine-green is the best sensitiser for the extreme red; cyanin for red and orange; erythrosin and rose Bengal for yellow; eosin for greenish-yellow; chrysaniline for green. In the course of a research in which different regions of a solar diffraction spectrum were photographed, Dr. Hasselberg, of the Pulkowa Observatory,† found cyanin to be useful as a sensitiser for that part of the spectrum extending from C (red) to wave-length 5600 (yellowish green); eosin for the region between wave-length 5600 and the Fraunhofer line *b* (full green); chrysaniline for the region between *b* and F.

Mixtures of Dyes.—The fact that the maximum in sensitising effect of different dyes corresponds with different parts of the spectrum at once leads to the supposition that by mixing the dyes it should be possible to make a plate equally sensitive to all parts of the spectrum; but this supposition is not entirely confirmed by experiment. In many cases the action of one dye is interfered with by the simultaneous presence of another. For example, the

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[*] These curves are taken from Eder's "Ausführliches Handbuch der Photographie."

[*] *Eder. Monatsheft. f. Chemie* 6, 927-953.

[†] Photographic News 1886, page 757.

effect produced by a mixture of eosin and cyanin is not the sum of the effects produced by each dye separately, but one interferes with the other. If eosin is present in excess, the action of cyanin is diminished, and *vice versa*. This is shown by curve No. 9, fig. 3, in which the dotted part of the curve represents the effect when eosin is in the greater proportion, and the unbroken curve the effect when cyanin predominates.

According to Schumann the effect of cyanin in sensitising for orange is also diminished by admixture with aniline red or quinoline red as recommended by Vogel. Eosin and cyanin are compounds belonging to entirely different groups, and it is probable that the interfering action will not be observed with mixtures of compounds of similar constitution, such as eosin, erythrosin, and rose Bengal, which are all closely related to one another.

Ives' experiments show that chlorophyll and eosin in a collodio-bromide emulsion plate do not interfere with one another, but, on the contrary, one aids the other. The sensitising effect of chlorophyll is greatest to red, orange, and dark green, weaker to blue and violet, and weakest of all to yellowish green. The effect of eosin is greatest just where that of chlorophyll is weakest, *i. e.*, to yellowish-green, whilst it exerts a notable sensitising action to dark green, very little to yellow, and none to orange and red. In a photograph of the spectrum on a collodio-bromide emulsion plate stained with both chlorophyll and eosin the weakest action below F is stronger than the strongest action in the violet, a complete reversal of the result obtained with an unstained plate.

The Use of Screens.—Except in the case of Ives' chlorophyll eosin plates and plates dyed with naphthol blue, although the sensitivenesss to orange-yellow or yellowish-green may be very much increased, it still remains far below that to blue and violet, as may be seen by comparing the areas of the two parts of each curve. Now sunlight contains a large proportion of blue, violet, and ultra-violet rays, which have very little effect on the eye, but a great effect on a photographic plate, and it follows that the curve representing the photographic action will still differ greatly from the curve of optical effect, and therefore coloured objects will not be rendered with correct gradations. In order to secure the desired result the sensitiveness of the plate to blue and violet must be diminished, or the intensities of these rays must be considerably reduced before they reach the plate.

It has already been stated that certain dyes have the property of reducing the sensitiveness of a plate to blue and violet, but the usual method is to cut off the greater part of the blue and violet rays by means of a yellow or orange screen. This is placed in front of the plate or lens, and allows red, orange, yellow, and greenish-yellow rays to pass, but stops all or nearly all the blue, violet, and ultra-violet rays. The character of the result obtained with a plate stained with eosin, using a yellow screen in front of the lens, is shown by curve No. 10 (fig. 3), and it will be seen that under these conditions photographic action approximates somewhat closely to optical effect (fig. 2.) The exact colour of the screen must be selected according to the effect which it is desired to produce, since it is obvious that by cutting off a greater or less proportion of blue, violet, and green rays by altering the colour and intensity of the screen, the relative effect of yellow, orange, and red rays can be increased or diminished at will. It is scarcely necessary to point out that this cutting off of so large a proportion of the photographically active rays necessitates a considerably longer exposure, the increased time required depending on the proportion of rays cut off, or, in other words, on the character of the screen. Obernetter and Vogel have, however, recently introduced plates which are relatively so very sensitive to yellow and orange that they can be used without a yellow screen. Plates prepared by their methods are highly sensitive, and if greater experience shows that the results obtained with them are as good as they seem to be, the advantages of these methods are obvious. The methods will be described in detail later on. At present the processes have the great disadvantage that the prepared plates cannot be kept for more than three or four days. The mere use of a screen, however, involves no serious amount of trouble or inconvenience; the chief drawback is the increased length of exposure required. The nature of the screens commonly employed, and the methods of using them, will be described subsequently. When photographs are taken by lamp light or gas light, in which the proportion of blue and violet rays is much lower than in daylight, no yellow screen is required except in special cases, and since dyed plates are so much more sensitive to yellow rays than ordinary undyed plates, it follows that the former are much more sensitive to gas or lamp light than the latter.

Eder* has made a series of experiments with a view to determine the relative total sensitiveness of dyed and undyed plates. Daylight and an Argand gas burner were used as sources of illumination, and Warnerke's sensitometer was employed in the photometric measurements. The plates were immersed in the dye solutions without any treatment with ammonia, and were then dried. The gelatino-chloride plates were developed with ferrous-oxalate or ferrous-citro-oxalate, and the gelatino-bromide plates were developed with alkaline pyrogallol.

	Gaslight.	Daylight
Sensitiveness of ordinary chloride plates	1·0	1·0
„ chloride plates + 1 : 20,000 eosin	1·3	0·3
„ „ „ + 1 : 80,000 eosin	1·7-2·1	0·6-1·0
„ „ „ + 1 : 20,000 cyanin	1·7	0·3-0·5
„ ordinary bromide plates	50	5
„ bromide plates + 1 : 30,000 eosin	60-120	4-5
„ „ „ + 1 : 20,000 cyanin	45-55	2-3

With equal exposures a much more intense photographic image is obtained with dyed than with undyed plates, and negatives on dyed plates are much freer from halos and irradiation effects. It would appear as if the dye behaved in the same manner as free alkaline bromide, and gives a more distinct image at the expense of sensitiveness. The colour of the reduced silver is also affected by the presence of the dye.

When ammoniacal solutions of the dyes are used the effects will be different, and the increase of sensitiveness much greater.

(*To be continued.*)

CHEMICAL THEORY IN ITS PRACTICAL BEARINGS ON PHOTOGRAPHY.

BY RALPH W. ROBINSON.

IV.—The Latent Image.

When a collodion or gelatine plate is exposed in the camera, the sensitive substance is so altered where acted upon by light, although there is no visible change, that the action of a developer produces a visible image of metallic silver in a fine state of division. The nature of the change is exceedingly obscure, and has baffled all the attempts of scientists to explain it with certainty, those facts which are known in the matter having led philosophers to different conclusions.

The theory which now seems to be most generally accepted is, that a minute portion of the silver compound (chloride, bromide, or iodide, as the case may be, and which are named generically the haloid salts of silver, and represented in this paper thus, $Ag\bar{H}$; $\bar{H}$ standing for one atom of Cl, Br, or I) is split up into two bodies; the sub-haloid, containing twice as much silver in proportion to the halogen as the normal haloid; and free halogen thus—

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* *Monatsheft. f. Chemie* 7, page 1-8. *J. Chem. Soc. Abstracts*, 1886, p. 497.

$$2\ Ag\ H = Ag_2\ \overline{H} \times \overline{H}$$

In support of this theory, we have the admitted fact that when silver chloride or bromide is exposed to light for a considerable time, the sub-chloride or bromide is formed, and the halogen liberated, also that this change takes place more rapidly in the presence of a substance which will absorb the halogen—in the case of silver iodide, the presence of such a substance necessary before the change produced by light will take place. Although it has not been found possible to detect *directly* the presence of the sub-haloid in a plate which has been exposed sufficiently long to form a latent or developable, but not a visible, image, yet the most obvious theory is, that the effect of a short exposure to light is the same in *kind* as that of a long exposure, the difference consisting solely in the *amount* of change effected. The following and other experiments seem to prove this.

A glass plate supporting a film of iodide of silver in collodion is dipped into a solution of potassium iodide to destroy all silver nitrate which would absorb iodine. It is washed and dried, and then a thin silver plate is pressed into contact with the film, and the glass side of the plate exposed to light under a negative. On development an image is produced both in the collodion film and the silver plate. If the halogen be not liberated, how is it possible to explain the appearance of the image on the silver plate? No image is formed on the part of the plate which is not in contact with the silver, that is where there is no compound capable of combining with the liberated halogen.

In the wet collodion process we have silver nitrate as the halogen absorbent, this reaction taking place—

$$2Ag\ NO_3 + 2\overline{H} + H_2O = 2Ag\ \overline{H} + 2H\ NO_3 + O$$

(The reader must not confuse $\overline{H}$, used to represent the halogen, with H, the symbol for hydrogen.)

In the gelatine process the halogen liberated is absorbed by the gelatine, the exact nature of the reaction being uncertain; but probably the compound radical hydroxyl (HO) is replaced by the halogen, the former being set free. It has been objected to the sub-bromide theory that no such thing is known as two chemical substances having the same outward properties, but no difference has yet been discovered in the appearance and solubility of the latent image and the unacted on haloid. In reply to this it is held that only such a small quantity is reduced that it is invisible. Also there are numerous isomorphous salts, homologous bodies, and intermiscible isomeric alcohols, which it would be quite impossible to distinguish by these "outward" properties. In connection with dry plates and alkaline development there is an important fact which the sub-bromide theory does not explain. By the action of alkaline pyro, plain unexposed silver bromide is reduced to the metallic state, even in the presence of a considerable quantity of soluble bromide. Why then does the gelatine interfere with this action of the developer on the unaltered normal bromide, but permit of its taking place readily with the supposed sub-bromide? Even if the sub-bromide is more readily attacked than the normal bromide, it is difficult to believe that while permitting the action of the developer on the one compound, it entirely stops it on the other.

Another theory, first stated by Carey Lea, is known as the dynamic theory. The action in the sensitive substance is compared to the action of light on a phosphorescent body, such as luminous paint. The motion of the atoms of the sensitive body is altered by the beat of those rays of light to which they are sensitive, and when in this altered state of motion the silver has less hold on the halogen, hence the haloid salt is more easily decomposed by the developer, most so where the light has acted most intensely, and least where the light has been feeblest.

To make the parallel with the phosphorescent body perfect, when the plate is removed from the action of light the motion of the atoms should gradually return to its normal condition; but this seems not to be the case, for we know that the latent image produces the same result (in a plate which does not decompose with keeping), whether developed directly after exposure, or after a lapse of years; and it is difficult to understand how a certain kind of motion, differing from its normal state, having been set up in an atom, this motion is continued when the cause of the altered motion is removed.

A third, the most recent theory, but I believe only applicable to the image in dry plates, has been propounded by H. S. Starnes. He states that each particle of silver-bromide is protected by a covering of gelatine. If this covering did not exist, on the application of the developer the bromide would be reduced. The moment light impinges on these particles, before they can vibrate, the protecting covering is broken, and thus the particles of bromide acted upon are relieved from this confining property of gelatine. The strength of the gelatine covering therefore controls the rapidity of the plate. As Starnes' arguments and the discussions upon them have been recently published in the photographic press, and these articles being intended rather as a record of the chemistry of ordinary photographic processes, than to be in any way controversial, I will not take up more space with this theory, but refer the reader to papers read by Starnes before the London and Provincial and South London Photographic Association, and published in the Photographic News of March 19, April 9, May 14, and May 21, 1886. and to letters and discussions on the subject by the London and Provincial Photographic Association published in the *British Journal of Photography* in March and April, 1886.

Neither the chemical nor dynamic theory satisfactorily explains the degrees of sensitiveness of plates prepared by different processes, or by variations in the same process. With these considerations, and by what has been stated above, I think it is clear that the present theories are both imperfect and "not proven," and further discoveries must be made before we can say much with certainty about the nature of this fundamental fact in photography.

BUSINESS MANAGEMENT.

BY CRITICUS.

No. III.

It is quite probable that the episode in our concluding paragraph of the previous paper may have been an exceptional case, and instances of dabblers who produce photographs for sale are of rare occurrence. We trust this is, and ever may be so, in order that the well known *esprit de corps* now pervading both amateur and professional elements, shall always be preserved.

Many who read these chapters will remember a period in the history of professional photography when the most meagre acquaintance with the subject rendered it possible to establish a portrait studio in or near any good business thoroughfare at a very moderate outlay, and by dint of little personal trouble merge it into a steadily remunerative concern. Various systems of conducting business were then in vogue, all evidently suited to the requirements of the time, and beyond question peculiarly advantageous to the followers, and it is not at all surprising to find that the success attending some of the promoters' efforts should have resulted in amassing considerable fortunes. It would be impolitic to mention individual instances, but we know of photographic businesses which originated in the most unpretending manner that a few years ago yielded profits of several thousand pounds annually. These were indeed palmy days, when at home and abroad alike, one met with the satisfactory report that photographers were in a flourishing condition. For a long period there has been much depression, perhaps greater in proportion to that experienced in many other directions; but the return of prosperity appears to be fast approaching, and those who contemplate entering upon a professional career at the present juncture will probably do so with fair success.

As many amateurs and others now desirous of engaging in the business of photography may have a preference for that branch devoted to portraiture, and wish to possess suitable studios to aid them, it becomes advisable to indicate some of the conditions bearing thereon which demand attention. At the outset, two primary questions are presented, which must be disposed of before the first step can be taken towards conducting business: one refers to the purchase of a going concern, and the other to constructing convenient premises in a promising locality. These questions can only be decided in accordance with the influences brought to bear on each case by surrounding circumstances. With regard to the first, however, we feel bound to say that there is much to commend it to the full consideration of expectant beginners, not only as far as definite outlay is concerned and convenient arrangements for immediate work, but especially on account of the opportunity now generally afforded would-be purchasers to enter into and take active part in the general routine of the establishment, between the date of lodging the usual deposit, and that of taking actual possession. This short experience is of such beneficial importance in many ways, that the condition should, whenever possible, be enforced as one of custom. Not only is such a proceeding likely to present abundant facilities to study the general character and arrangements of the concern, by mere attentive observation, but an early acquaintance with certain characteristics, more or less peculiar to the *clientèle* of a photographic business, is of considerable advantage.

To the tyro, this latter opportunity must be looked upon as a great boon, especially so should he not be possessed of overmuch confidence in his own abilities. We have often noticed what an influence a little experience of this kind given beforehand has in preventing after-displays of inherent nervousness in natures so constituted, owing, most probably, to a semi-conscious inability to fully sustain the rôle undertaken; and we are, for this reason, inclined to attach greater importance to the condition named. We are far from avowing that the practice of an ordinary photographic business tends, to an abnormal extent, to disturb one's equanimity over that of many other pursuits involving some culture and scientific training; but do declare positively that there is much to produce irritation in a photographer's everyday experiences with ordinary sitters, and are further inclined to the opinion that when customers of an exacting or over-bearing propensity find little difficulty in practising their arts successfully, they are not slow to use the power for their own advantage. Indecision in business matters is probably the chief characteristic to be avoided, for the reason that it weakens instead of giving power, and we regard it as an essential condition towards ultimately achieving financial success that neither indications of embarrassment nor arrogance should by any possibility be permitted to display themselves when dealing with customers, whatever the inner promptings may be. To be calm, self-reliant, gentlemanly, and, above all, firm with such turbulent and perverse natures as occasionally trouble the photographic practitioner, is by no means an easy task; but such a frame of mind as that indicated may be cultivated, and the sooner those who desire to become successful portraitists commence this part of their training the better.

There are always businesses for sale, and those desirous of purchasing can make a selection from the advertising columns of this paper at any time. We will take the following as typical, and note the more important conditions usually complied with in such a transfer:—

> "High-Class Business for Sale. Old established, commodious premises. Good light, splendid position. Several thousand negatives.—Address, Genuine, News Office."

As a preliminary, the *locale* of the business for disposal should be ascertained from "Genuine," together with answers to such general questions as its antecedents, price, outgoings in the shape of rent, rates, wages, &c., and any information the vendor may choose to communicate concerning his scale of charges and average business done. The reply is usually sufficient to form a fairly accurate estimate of the desirability or otherwise of continuing negociations. Should a personal interview be sought—and this is not found inconvenient—then it should be accepted, as progress is likely to result: but when at an early stage of negociations an "earnest" or money payment is required before questions can be dealt with, then an element of uncertainty appears to present itself to those enquirers whose intentions are fair and honourable, for the general custom is to pay a moiety of the purchase money—called a deposit—after an agreement has been arrived at. Transactions of magnitude between parties unknown to each other are rendered more secure by conducting the business through a solicitor, and there is much in favour of the system, especially when references exchanged do not entirely satisfy the exigencies of the case. Objection should be raised to the payment of a preliminary deposit, which, by the way, is not always returnable in full, or its equivalent allowed, and the agency of the lawyer may also be deemed unnecessary; still, it must be borne in mind that although it only needs two parties to make a contract—each presumably being equally interested—yet experience has shown that some kind of special provision is generally necessary to prevent needless waste of time, and check inquisitive correspondents. A very useful rule enunciated by W. Ackland as a guide to the value of a photographic business may here be repeated. That gentleman considers the goodwill and negatives of a business in good working order to be worth a sum equal to the profits of a year and a-half, and with this estimate we are quite in accord.

Assuming, then, for illustration, that enquiries have laid bare the facts that business of a genuine character has been carried on by the vendor of our typical establishment, which has resulted in a fair profit; the position is attractive, and in a good business thoroughfare; the internal arrangements are satisfactory, especially as regards construction of studio, dressing, and reception rooms; while the quality and style of the specimens displayed about the premises indicate both care in production, and discreetness of selection; proper entries have been made of all orders received, and work sent out, the books showing actual receipts, expenditure, and debts still out; from this information we have been enabled to gather that there has been no diminution in the average receipts during the three years previously, but over the latter portion of the time there has been some increase, while prices remained the same. Negatives have been carefully stored and catalogued, and a fair proportion of repeat orders received even from among some of the oldest. For such a business, then, eighteen months, or two years' profit value would not be too high a sum to name as the equivalent for goodwill and negatives, &c. Apparatus and stock form separate items for consideration in our next. Conditions other than the above may step in to very possibly alter the complexion of affairs later on, unless suitable precaution be taken to prevent the happening thereof. We allude to landlord privilege, to increase rent, or to the vendor's determination to re-establish himself in close proximity. The latter can always be provided against by penalties extending over a long period; not so the encroachment of the former, and a rent charge which has enabled the vendor to live and show a remunerative balance sheet may only have a transient existence. Some people might argue that the sum paid as rent is not of the least consequence, for a high rent means business importance; but when the rent is suddenly doubled, and all other factors remain the same, it becomes difficult to appreciate the advantage.

Notes.

New vigour seems to have been infused into the Photographers' Benevolent Association, if we may judge by the proceedings at the annual meeting held last Monday night—the largest meeting of the Association which we remember to have seen.

Tha rule limiting the Association to professional photographers has been altered so as to allow all interested in photography to become members; and many amateurs have already intimated their wish to join.

A friendly letter was read from the Rev. Father Tooth, of Hatcham, and the letter was accompanied by an intimation that in the case of a member leaving an orphan boy, a home would be found for him in a school under the care of the writer.

J. Hubert figured at the meeting as a financial reformer, one scheme of his being a system of money boxes so placed as to receive the contributions of the benevolent, and the other a plan for economising the funds of the Society; and he intimated his wish to do good service to the Society upon its committee. As however, no one proposed him, he nominated himself, was seconded, and was elected by majority of those present. At the first show of hands there seemed to be an equality of votes, and as the Chairman hesitated to give a casting vote, the show of hands was taken a second time, with the result above-mentioned.

The collector is often a useful aid to the historian, whether his mission is to collect pictures, fiddles, coins, or stamps; but, owing to the circumstance that collections are so often distributed at the death of the collector, much useful work is lost. Time may come, however, when the value of national as opposed to private collections is better understood.

Among collectors who have worked to good purpose is John C. Ropes, who, since 1873, has occupied himself by collecting authentic portraits of him who first brought the southern civilisation to Britain—the mighty Julius. At the present time, knowledge is so far socialised that he who cares to spend one shilling may become lord of all that collection laboriously made by J. C. Ropes; he has only to buy the current number of *Scribner's Magazine*.

"Whenever," says Mr. Ropes, "I saw a reasonably good likeness of Cæsar, I had it photographed, when it was possible to do so. I found that with a little money and patience, the obstacles in the way of obtaining photographs of these busts could, in nearly all cases, be overcome." The collection consists of eighteen block prints, sixteen being from photographs of busts, and the best of these block prints are photo-blocks apparently made by Ives' process. The photo-type blocks print even better than the wood engravings, the prints being vigorous and solid. Each gradation is clearly marked, while the light tints are clean, and free from spots of dirt.

A correspondent wants to know whether there was a motive in not adopting the report and balance sheet at the last meeting of the Photographic Society. As he points out, both documents, as they now stand, are informal, and it is open to anyone to raise a discussion at the next meeting by moving that they be adopted. There was one matter, he remarks, upon which the treasurer seemed to desire discussion, but no one said a word; and possibly it was to give the Society another chance that the formal adoption was passed over. The matter on which Mr. Bird had his doubts was in reference to the heavy cost of the Journal, and he threw out a hint that the expense might be lessened if it were issued quarterly. This really seems to be a subject on which the members should give an opinion. If the object of the Journal be the preservation of the members' utterances in full for the benefit of future generations, then publication once a quarter, or even once a year, would answer the purpose; but if the Journal be intended as a link to bind the Society together, so that those members who were absent might know what has been going on, it should be published once a month, and as soon as possible after the meeting. Our correspondent adds: "I know what the respected president's answer would be to this: that members have no business to stay away from the Society's meetings. Quite true; but alas! the majority of us are weak, fallible mortals, with a multiplicity of engagements. Anyway, if the Journal were issued quarterly, I don't think anybody would read it."

A well-known photographer made the suggestive remark the other day that better work relatively was done by amateurs on large plates than on small. His reason was that the cost of small plates being trifling, the amateur was indifferent about spoiling one or two, and this led him to be careless. With large plates, on the other hand, he had to be sure everything was right before he made the exposure, because he knew well that if he failed his pocket would be seriously affected. There is something in this notion. Indeed, we are inclined to think that this regard for the value of the material influences artists who draw for the periodical press as well as amateur photographers. Many artists who have to throw aside wood for card in accordance with the "cutting down" spirit of the times, show a deterioration in style which seems to be due more to slovenly execution than a want of adaptability to new requirements. Drawing on wood certainly demands more care than drawing on card, because a slight inaccuracy in the latter can easily be rectified. But this very power of being able to correct errors is very dangerous, as it sometimes happens that the bad drawing is not corrected, while it certainly affects the fineness of touch.

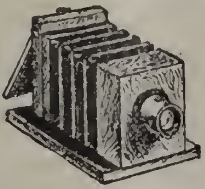
Photographic portraits on china are said to be the latest craze in America. There is no objection to this so long as the portraits are confined to plaques, but when the portraits of one's family appear on the dinner service, the idea cannot be said to be a pleasant one. An an American paper forcibly puts it, when papa eats his dinner he sees a slice of beef reclining on his better half's plump cheek, her still brilliant eyes entirely obscured by green peas, while her right arm tenderly regards him through a film of gravy. There is something particularly objectionable in all this, perhaps not so bad as carrying the portrait of the lady you like best on your pocket handkerchief, but not far short.

It is said that photography will occupy a prominent place in the International Exhibition to be held in Glasgow during 1888.

Some years ago we suggested the possibility of making a real camera and lens to sell at five shillings—something that might serve as a means of giving a lad his first insight into photography.

Our suggestion has been more than verified, a camera and lens being now made to sell at three and sixpence; and, moreover, this sum includes a packet of plates and materials for development, also a sheet of elementary instructions in photography.

The camera in question has been sent to us by the vendors, the American Camera Co., of 399, Edgware Road, and it is a real bellows camera, made of mahogany, and complete with lens and dark slides; in fact, the accompanying cut—issued by the vendors—fairly represents it.



As a present to a lad, this toy camera may be very useful, and we can testify to the possibility of taking a passable photograph with it.

Some weeks ago, in speaking of printing collotype at the steam machine, we stated that collotype at the steam press has met with but scanty success in this country; and in connection with this subject we must refer to some very fine specimens of collotype printing just received from Waterlow and Sons, of Finsbury; and from a communication accompanying them we learn that this firm has worked collotype plates at machine during the past two years.

We are accustomed to find a large amount of untruth in advertisements, but do not very often find a mis-representation which is so obvious as the constantly occurring announcements that "The only medal for apparatus ever awarded by the Photographic Society of Great Britain, has this year been awarded to ——'s camera." No medal of any kind has been awarded by the Photographic Society this year, and of the medals awarded for apparatus last year, not one was for a camera.

When a Roman general had deserved especially well of his country, it was the custom not only to vote him a triumphal reception, but to attach a flute-player to his retinue; it being the duty of this musician to accompany the successful warrior everywhere, and to herald his approach by his "tootling." Now, it can be readily imagined that even a musical veteran would in time get tired of the continual presence of an indefatigable flautist, prone to "tootle" at the very least provocation. It is even possible that the more irreverent and irrepressible of the Roman street-boys came also to regard the victorious general and his official flute-player as a kind of gratuitous and ludicrous out-door show to be chaffed and "chivvied" on all favourable occasions, and it says much for the self-repressive powers of the popular warrior of Ancient Rome that there is no record of any of them having turned upon his too-attached musician and cut him to pieces.

Other times have brought other manners, and when we wish to reward a successful general we call him a "Peer," or make a statue of him, instead of giving him a flute-player. But it seems to us, nevertheless, that the celebrity of the present day, though his steps may not be dogged by a votive "tootler," is subjected to a somewhat similar infliction when, thanks to the fame he has attained, he finds his daily path infested by the enterprising and irrepressible photographer. Prince Bismarck, it would seem, has of late been especially annoyed by the attentions of such men, one of his persecutors in particular having for more than a week haunted the great Chancellor like his shadow, whilst he (the photographer) "took shots at him" (of course in a purely professional sense). The very fact that Prince Bismarck is thus pestered is in itself proof of his popularity; the intrusive photographer being, equally with the official flautist, a penalty of fame, whilst the irregularities committed by unauthorized photographers in search of negatives may actually lead to the appointment of official photographers whose duty it will be to always follow in the train of the celebrities to whom they are attached, ready to perpetuate, by means of a dry plate, every incident of interest which may arise.

Say, for example, an official photographer were voted by a grateful country to "Our Only General." The result would be that every time Lord Wolseley in the course of a morning stroll stopped to speak to an old pensioner, or halted to gaze significantly at the Nelson Monument or the statue of some great general of the past, or gallantly pioneered an old lady over a Pall Mall crossing, or saluted a passing squadron of Life Guards, the official photographer would do his duty, and the shop windows would soon contain a kind of photographic record of the daily life of the hero of Tel-el-Kebir. There would naturally be always a chance of Lord Wolseley, or of any other celebrity of short temper, turning on his official photographer and at least maiming him for life, and it is therefore perhaps better, on the whole, that things should go on as they are.

The consideration of the case Templeton *v.* Edwardes would be probably much facilitated were it possible to attach to the affidavits what may be called "photographic exhibits" of the costume on which much of the controversy turns. For whilst Miss Fay Templeton maintains, on her part, that her dress or her manner of putting it on were alike unobjectionable, the management of the Gaiety asserts that the dismissal of the plaintiff took place in consequence of the way in which she wore the costume in question. Clearly, then, the production of photographs showing how the said dress actually was worn, would be of considerable assistance to the judge who may eventually have to decide the points in dispute. Thus the moral of the incident is one decidedly favourable to photography; since it tends to show that burlesque actresses in future should be photographed in every new costume in which they appear.

Our remarks last week as to the "cheap and nasty" system of reproduction from photographs in vogue in the printing department in connection with the police are fully borne out by orders which have been since issued. In future, the detective department will not be limited to the circulation of a single likeness, when it is possible to procure several; and it is mentioned that some revision of the printing contract will follow whereby better paper may be used. The proof taken from the block (this, by the way, was prepared from a ferrotype) on good paper presents a very different appearance from the smudgy portraits actually issued. This is quite possible. But if, as it is hinted, the want of resemblance between the caricature and the original led three constables to hesitate about apprehending Currell, does it not seem hard that they should be punished, as they have been, for what was clearly the fault of the detective printing department?

Melton Prior, the well-known correspondent of the *Illustrated News*, has been repudiating the statements respecting the photographing of the Burmese prisoners as they were led to execution. We do not quite gather from the meagre report of Mr. Prior's remarks what it is he wishes to contradict. We learn that "he never saw one execution that was not conducted in the most humane and expeditious manner possible under the circumstances, and many of the sentimental statements made about Col. Hooper, Provost Marshall, were absolutely false." This is rather vague, but accepting it for what it is worth, is it not rather a matter of opinion as to what was "the most humane and expeditious manner possible *under the circumstances?*" We have italicised the last three words because much may depend upon the "circumstances." For instance, if dry plates were used this method would be considered "humane and expeditious" because the criminals would not be kept waiting so long as they would be were wet plates employed. But this may pass. The point to be settled is, were the condemned men photographed as they were about to be executed, or not?

DUST OF GOLD.

BY A. P. LAURIE.

The silver print still holds the field, because of the variety of delicate and beautifully tinted pictures obtainable during the process of toning; and the question has often been asked, can such variation of colour be produced by metallic gold alone, or have we in some cases, perhaps, an image of metallic gold, in others of an oxide of gold, or of more complex compounds? Just as it is an unsettled question whether the image of an untoned silver print consists of metallic silver, or of some complex compound of the metal with some other substance, so we are not yet sure that after toning our image consists of metallic gold.

This one problem of the many unsolved problems of photography was suggested to me afresh the other day on looking at some prints prepared by Mr. Lionel Clark. Mr. Clark had pasted on one sheet of cardboard a series of little pictures, each of which had been toned in a slightly different way. In this manner he had produced a set of prints each differing in colour from the rest, and passing from deep purples and greys to reds and browns. Is it possible, I asked myself, that all these wonderful colours can be produced from metallic gold alone? And thinking it over I saw that though there is unfortunately no immediate prospect of answering this question by appeal to direct experiment, yet there are many facts known about the properties of gold which show that it is not only possible, but probable, that these varied tints come from finely-divided gold.

Some of these facts about gold I have collected and shall state them here, simply throwing them together with no attempt at classification. Many are very familiar, a few are not so well known. The main facts I re-state from a recent lecture by Professor Robert Austen, Chemist of the Mint, which he delivered at the British Association last summer, taking as his subject the colours of metals. Some of the facts do not come from so reliable a source, but they all point the one way, that is to the apparently unlimited variety in colour obtainable by different preparations of metallic gold.

To take first the well-known properties of gold re-stated by Prof. Austen. Gold in its usual state is known by its yellow colour, but it is also possible to obtain a deep ruby or purple by a special preparation of finely-divided gold. This preparation is known as Faraday's gold, and consists of very small particles of metal suspended in water. So finely divided is this Faraday gold, that some prepared by Faraday and put aside many years ago has not yet settled to the bottom of the liquid, but still remains in suspension. If, instead of observing the light reflected from gold, we obtain it sufficiently thin to observe the light transmitted through it, we find that it is of a bluish green. This is easily observed by holding a piece of gold-leaf up to the light, after treatment with potassium cyanide.

If we precipitate gold in finely-divided state, though not so fine as Faraday gold, we obtain it of a blackish purple colour. I have already enumerated five colours and shades of colour obtainable from gold, namely, yellow, ruby to purple, green, and blackish purple; but this does not by any means exhaust the list. In Crooks' select methods of analysis, a method is given for testing ores for traces of gold which depends upon the property of the metal of tinting a white surface when in a fine state of division. The ore, having been washed, is treated with bromine water or tincture of iodine for some hours. Any gold present is thus dissolved, but is probably so small in quantity that no ordinary test could detect it. A piece of filter paper is therefore dipped in the solution, dried, and burnt. Any gold sopped up is thus left in the white ash of the filter paper in a very finely divided state, and stains it delicate pink, or purple, according to the quantity present. We have not yet exhausted, however, the tints obtainable from gold.

In a quaint and original, if not altogether trustworthy book entitled "Pyrology, or Fire Chemistry," it is stated that if gold is volatilised under an intense heat, and the vapour of the metal allowed to condense upon an aluminium plate, a series of rings of wonderful colours are produced; and at the beginning of the book an attempt is made to illustrate these colours by a very beautiful lithograph.

In conclusion, let me give a final example of the chameleon-like properties of this metal, which has come recently under my notice. It has been, I believe, often asserted that a brown tone consists of oxide of gold. Now I have recently obtained this very brown colour, more than once, under conditions which proved it to consist of nothing but finely-divided gold. To obtain this colour we have only to decompose by heat some double salt of gold, such as, let us say, bromide of gold and potassium. On heating this salt it is decomposed, leaving a mixture of metallic gold and bromide of potassium, and, under certain conditions, this metallic gold is scattered through the potassium bromide in a very fine state of division. This results in the decomposed mass having a delicate brown tint very similar to that observable on a brown toned print; and I think it is quite possible that, by decomposing gold salts in presence of varying amounts of foreign substance, we may be able to obtain various shades of colour similar to those obtained during the process of toning prints. This possibility suggests further that these variations in colour may depend not only on the state of division of the metal, but also on the white light from the background mingling with that reflected by the metal itself, and it is by this blending of the light from the background, and of the light reflected by the gold, that many of these exquisite tints are produced.

Another possible source of some of the colours obtained in toning may be found in the metallic gold alloying with some of the silver in the image, while being deposited, and thus forming a new series of shades. Undoubtedly a hard-toned print contains very little silver, but some of the intermediate tones might be due to this cause. All speculation, however, on this fascinating but obscure subject would be premature at present. The simpler problem of the blue of the sky, produced apparently by light reflected from very fine dust, still awaits solution, and the variety of tints obtainable from finely-divided metals and oxides are doubtless due to still more complex causes. Nevertheless, I think I have shown that it is not only possible, but highly probable, that the lovely variegated tints of toned prints are not caused by various compounds of the metal with organic substances or with oxygen, but are simply and solely due to "dust of gold."

INSTANTANEOUS STUDIES.

No. 7.—The Independent Sitter.

Independent Sitter. Look here. I want my portrait taken.

Photographer. By all means. Will you sit down in that chair?

I. S. Eh? I hate sitting. Everybody sits. Why can't I be taken standing?

P. Certainly, if you insist upon it; but we are more likely to get an artistic pose sitting.

I. S. Oh, yes! I know what you photographers mean. Now, with all deference, I don't think much of your artistic poses. I want you to make a picture of me just as I am. Something like this.

(*Stands in the Englishman's favourite pose, hands in pockets, legs very wide apart, full face towards the camera, background an imaginary fireplace.*)

P. I shouldn't advise you to be taken in that inelegant position.

I. S. Pooh, I don't care for elegance. It's the likeness I want. Everybody will know me as I'm standing now. Just as I do at home.

P. No doubt. But they may not like the picture, and they will, of course, throw the blame on me.

I. S. Oh, don't you worry yourself about that. I want my portrait to be thoroughly natural and unconventional. See? Fire away, now, I'm ready.

P. (*rather stiffly*). Very good.

I. S. (*seeing him approach with head-rest*). I say, I'm not going to have that thing.

P. I assure you it is indispensable with a standing figure.

I. S. You needn't be afraid I'm going to move. That thing always makes everybody look so stiff. (*Stares hard at the camera, and holds his head like a drill sergeant.*)

P. If properly used, the head-rest should not have any effect at all.

I. S. No! that's what you say. I know better.

P. (*putting by the head-rest in despair*). Very well, only don't be surprised if you have two heads. Perhaps you wouldn't mind turning your head a little from the light, and looking in *this* direction. (*Indicates spot.*)

I. S. Well, but that won't show my eyes.

P. Oh, yes, it will.

I. S. Not full face?

P. No, not quite full face.

I. S. Ah! that won't suit me; I'm always taken full face.

P. Just as you please, only I wish you to understand that I will not be responsible for the result [*takes portrait*].

I. S. (*to Photographer, who has just emerged from the dark room*). Well, have I moved?

P. (*icily*). No, I cannot say that you have—much.

I. S. (*triumphantly*). There, I told you so.

A Week Later.

P. (*reading letter from I. S.*). "I am sorry to return you the proof. My friends say it (the photograph) is a hideous caricature, and not a bit like me at all. Besides, on looking at it through a powerful glass, I can distinctly see two noses. I must ask you to give me another sitting."

The Next Day.

I. S. (*reading letter from P.*). "Mr. G. Elatine presents his compliments to Mr. Blank, and begs to remind him that the pose was selected by Mr. Blank himself, and that the double nose is the result of his refusal to the rest. Under these circumstances, Mr. G. Elatine distinctly declines to give Mr. Blank a re-sitting." Well, I'm dashed!

COLLODIO-CHLORIDE PRINTING.

BY J. HUBERT.[*]

In demonstrating this process to you I claim no special merit, but wish to bear testimony to the simplicity of the operations of coating the paper with the emulsion, toning, fixing, and washing the positives, and the beauty of the results attained, as well as increased permanency over albumen prints, as far as my own small experience and few experiments will permit. I wish to raise an exhaustive discussion on its merits, as I am persuaded that sufficient justice has not been done in the case. I believe, moreover, that the working conditions of the process have been altered of late in such a manner as to fully entitle it to the greatest consideration. I shall endeavour to answer the following questions:—1. Is it a process of greater permanency than that in general use? 2. Will it be possible to achieve artistic and pleasing results without expenditure of exceptional skill and great additional labour? 3. The question that possibly may be raised with regard to outlay. This is not a momentous one if it is found possible to answer the first two satisfactorily.

Before I go into the question in detail, I must submit that the process, as brought before your notice some years back, was not such as to recommend itself readily to the practical worker. Troubles arose from the peeling of the delicate collodion film, curling of the prints in their moist state, and various other complications, including uncertainties in the toning operations, which made it justly appear a difficult process; but now, thanks to Dr. Liesegang, none of these troubles and uncertainties remain. That it is a very fine process facts show. I employ the process now in the case of customers who do not mind paying a little extra and can appreciate it.

Now with regard to the first question, permanency, I would suggest that if we subjected prints to such a severe test as they are never likely to receive—namely, exposing them in a show-case facing the sun outside of the house during one summer and a succeeding severe winter, and then nail them to a wall of a room where several gas burners are for a few months, and they stood this test—we may venture to call them very much more permanent than albumen prints. I have done this with the favourable result mentioned. Numerous eminent and respectable German firms will testify the same fact, I believe, and Captain Abney says: "In the year 1869 I printed all my negatives by the process. The prints had a beautiful black-brown tone, and some have been exposed to sun and gaslight ever since that period; others are mounted in a scrap-book; and others are loose in a portfolio. Out of the lot not one has altered in colour or purity of the whites. This is what I should have expected theoretically, for there is nothing to cause fading. The organic salt of silver, which has been altered by the light, is not a complex body, but one of definite composition, since it was the citrate of silver which was employed. On fixing the part not reduced, it dissolved out freely, and there is nothing to hold it back in the film, since it consists of collodion, which is essentially porous." The Court photographer, W. Cronenberg, has used nothing else for one and a half years. He says that he has a large quantity of the best albumenised paper left for which he has no use. Of course there are emulsions sold at such low figures as are inconsistent with the good article. It is owing to this fact that many photographers try the process and reject it as not superior to others. Some fail in consequence of their own wisdom, getting hold of or accepting any published formulæ from unknown writers, perhaps not even following the instructions closely.

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[*] Abstract of paper read before the London and Provincial Photographic Association.

From these and other instances, as well as my own experiments, I venture to maintain that members subjecting well-manipulated collodio-chloride prints, from Dr. Liesegang's or other good emulsions, to before-mentioned tests, they will not detect the slightest change. Furthermore, to prove that they are much more permanent than albumen prints, I shall immerse the two simultaneously in a solution of cyanide of potassium, not with a view to demonstrate that this solvent has no action, but solely to show that when the albumen print is entirely destroyed the collodio-chloride print is scarcely attacked. From the foregoing I do not think it unreasonable to conclude that the question has been answered satisfactorily.

We will now practically examine the second question, whether we shall be able to obtain artistic and pleasing results without employment of exceptional skill and additional labour. I here submit a number of prints in order that you may examine the depth to which they must be exposed in the printing frame. The time required scarcely equals and certainly does not exceed that of the albumen process. A not very unimportant advantage over albumen prints is the fact that collodio-chloride-paper prints do not expand, and you will note in the demonstration to follow that the great obstacle, curling of the prints in the water, has been entirely removed. With reference to softness and delicacy of the prints, I may mention that by varying the proportions of the chloride employed it is possible and advisable to modify the character of the print, and I believe that Dr. Liesegang supplies separate solutions for the purpose.

Since writing the above, I am very glad to subjoin that having prevailed upon Dr. Liesegang, that gentleman has been kind enough to give me the formula he employs for making the emulsions. It is as follows:—Dissolve 8 grammes (4 drachms 3 grains) nitrate of silver in 5 c.c. (1 drachm 25 minims) hot distilled water; pour this into 200 c.c. (7 ounces 18 minims) alcohol ·805; add 12 grammes (3 drachms 3 grains) pyroxyline. After the lapse of half an hour pour to it 250 c.c. (8 ounces 6 drachms 23 minims) ether; shake well. In another bottle dissolve 1 gramme ($15\frac{4}{10}$ grains) chloride of lithium and 1 gramme ($15\frac{4}{10}$ grains) tartaric acid in 50 c.c. (1 ounce 6 drachms 5 minims) alcohol. This second solution is poured into the first, agitating the combination well. For vigorous negatives take a little more chloride, as a softer print results from it.

I have made an emulsion by this formula last night in the space of ten minutes, not counting a half hour's interval, and coated a sheet of paper, and obtained some very excellent prints to-day without filtering. I have brought some of the baryta surfaced paper with me, and shall be pleased to give a sample to members who wish to experiment. I should advise to coat half a sheet at a time, or less at first. It is best to coat in a cool room, transferring the sensitised paper to a warmer one, but not to dry by heat. [The speaker here coated a sheet of paper with the collodion emulsion.]

To tone the prints I use Obernetter's toning formula, which can also be used with the gelatino-chloride prints. It is composed of the following:—No. 1. In 35 parts of water dissolve 5 drachms of sulpho-cyanide of ammonium. No. 2. In 15 drachms of water dissolve 15 grains chloride of gold. Into 100 parts of No. 1 pour 10 parts of No. 2, not *vice versâ*. In my own practice I dilute this with an equal quantity of water. As you will observe, their appearance in the toning and following solutions are by no means prepossessing, which, as you all know, is the case with many things that conceal beauty in some shape or another.

Patent Intelligence.

Applications for Letters Patent.

2382. Edgar Theodore Perken, 34, Southampton Buildings, London, W.C., for "Improvements in shutters for photographic cameras."—15th February, 1887.

2429. John Rudolph Gotz, 433, Strand, London, for "An improved roll-holder, film-holder, or camera slide for photographic cameras."—16th February, 1887.

2445. Arthur Henry Loring, 47, Lincoln's Inn Fields, London, W.C., for "Improved apparatus for containing and exposing plates or sensitized surfaces to receive photographic pictures."—16th February, 1887.

2483. Henry Elias Davis, 186, Fleet Street, London, E.C., for "An improvement in or pertaining to photographic shutters."—17th February, 1887.

2555. William Daniel Richmond, 18, Sparsholt Road, Crouch Hill, London, N., for "Improvements in photographic shutters."—18th February, 1887.

2634. Frank Bishop, 53, Chancery Lane, London, for "An improved photographer's lantern."—19th February, 1887.

2635. Patrick Francis Murphy, 53, Chancery Lane, London, for "Apparatus for turning over the leaves of books, more especially the leaves of photographic albums, applicable also for successively exposing pictures or advertisements, either bound together or loose."—19th February, 1887.

2662. Leon Warnerke, Silverhouse, Champion Hill, London, S.E., for "Improved photographic film paper."—21st February, 1887.

Official Abstract of Accepted Complete Specifications.

Pumphrey, 5,636, 1886. "Cameras" (including lenses and lens fittings). Ball and socket joints for attaching legs of stand to camera.

Coppin, 16,605, 1886. "Change boxes and slides." Back with slit at top, into which carrier, with pair of plates, is slid; flexible transfer bag.

Boles, 789, 1887. "Printing, colouring, and finishing." Brunisher heated by lamp; thermometer to regulate temperature; nurled feed roller.

Marsden, 9,970, 1886. "Tripod and like stands." Stem jammed in socket by sliding or hinged wedge, released by lever or push-piece.

Middlemiss, 5,450, 1886. "Cameras" (including lenses and lens fittings). Front detachably pivoted to baseboard for folding; back pivoted to plates which traverse slotted side plates.

Lowdon, 7,121, 1886. "Detective camera." Body in book form, with lens in back, with or without roller slide.

Patent on which the Fifth Year's Renewal Fee of £10 has been Paid.

775, of 1882. R. T. Wall. "Photography."

Specifications Published.

4179. Joseph David Williams, of Station Road, Greenfield, Holywell, Flint, Portrait Painter and Photographer, for "Improvements in or relating to photographic cameras and slides or appurtenances thereto." Dated March 25th, 1886.

A sliding adaptation in which focussing-screen and dark-back are mounted side by side.

15,532. Dr. Herman Wilhelm Vogel, of No. 124, Kurfürsten Strasse, in the City of Berlin, Prussia, Germany, chemist, for "An improved process for manufacturing isochromatic emulsion plates highly sensitive to light."—Dated 29th November, 1886.

My invention relates to an improved proces for manufacturing isochromatic gelatine and emulsion, and gelatine plates for photographic purposes, and to chemical preparation requisite for such said process. In the year 1873 I made the discovery that chloride and bromide of silver, which are only sensitive to violet, indigo, and the blue light of the spectrum, can be made sensitive to green, yellow, and red rays by mixing the above-mentioned salts with bodies which absorb the latter rays. If, for instance, chloride or bromide of silver is mixed with aniline red, which absorbs yellow rays, the chloride or bromide will become sensitive to yellow rays; or if chloride or bromide of silver is mixed with aniline green, which absorbs red rays, the same will be made sensitive to red rays. I denominated these bodies, which sensitize silver salt in the aforesaid manner, optical sensitizers, and I and others after me have discovered a large number of such optical sensitizers amongst the dyes, and in this manner the so-called isochromatic gelatine plates, coloured with an optical sensitizer such as cyanine, chinoline red, eosine, erythrosine, are now articles of commerce.

All these isochromatic gelatine plates are generally less sensitive than ordinary plates, and require a yellow glass plate interposed between the lens and the sensitive plate, for diminishing the power of the blue light. By this interposition of a yellow plate the time of exposure was lengthened, and if the surface of the plate was not quite even, the sharpness of the photograph was lost, so that these isochromatic plates are used on a small scale only for the reproduction of pictures or paintings, but not for portrait or landscape photography.

Now I have succeeded in making isochromatic gelatine plates, the sensitiveness of which is twice as great as that of the ordinary gelatine plates, and which do not require any yellow plate or screen. This discovery is based—

1. On the application of the eosides of silver, that is, the chemical combinations of eosine dyes with silver. These eosine dyes, or derivatives of fluoresceine, are all acids, and combine with silver to salts.

2. On the addition of silver salts to other optical sensitisers, for increasing their sensitising power.

As early as 1884 I observed this favourable influence of the presence of silver salts, and proved, for instance, that eoside of silver will give ten times more sensitiveness for yellow light than ordinary eosine, but I have only now succeeded in making plates without fog or film and spots, so that I can introduce the process into practice, and I have proved that it is possible to produce in this manner landscapes and portraits far superior to those taken with ordinary plates.

I have now invented the following methods for making highly sensitive isochromatic plates or sensitising solutions, so that any photographer or amateur can prepare his own isochromatic plates. In order to attain this object I proceed as follows:—

1. Ordinary gelatine plates are bathed in a solution of a soluble salt of silver (1 : 1000), then in a solution of an eosine dye, or a mixture of eosine dyes, or a mixture of an eosine dye with other optical sensitisers, with or without liquor of ammonia. The solution of the dye can also be used first and the silver solution afterwards, or an emulsion can be mixed with a soluble salt of silver and the dye added to the mixture, or *vice versa*, and with or without ammonia.

2.—A silver eoside is formed by mixing a solution of an eosine dye, or a mixture of different eosine dyes (for instance, ordinary eosine, blue tinted eosine, chrysoline, aureosine, phloxine, Bengal rose, or any other derivative of fluorescine) with a soluble salt of silver, such as sulphate, nitrate, acetate, or fluoride of silver. This eoside of silver can be collected as a precipitate, washed, and mixed with the emulsion, or dissolved in diluted ammonia or diluted acetic acid, and employed as a bath for soaking dry plates; but I prefer to add liquid ammonia, carbonate of ammonia, or acetic acid, during the process of precipitation, so that the suspended precipitate is dissolved, and to employ the same as sensitizing agent for fluid emulsions; or the said solution can be diluted with water, and used as a bath for dry plates. The quantity of this solution of eoside of silver to be employed varies according to the quality and kind of emulsion treated with the same, although the following formula will serve as a general guide for those employing my sensitising solution—50 cubic centimeters of a solution of an eosine dye (1 part dye to 1,000 parts water or diluted alcohol), 1 cubic centimeter of a solution of nitrate of silver (1 part nitrate of silver to 20 parts of water), 1 to 2 cubic centimeters of liquor of ammonia. This solution is either mixed with the emulsion—that is, 5 to 10 per cent. is added to the emulsion—or the same is diluted with 200 to 500 cubic centimeters water, and the gelatine plates immersed or soaked in the same for about one minute, and then dried.

3.—I furthermore use other dyes, known as optical sensitizers, which do not chemically combine with silver, but the sensitiveness of which is much improved by the presence of a soluble salt of silver, such, for instance, as cyanine, chinoline red, cornleine, &c., and mix them with any soluble salt of silver. I employ, for instance, 50 cubic centimeters chinoline red, or a mixture of chinoline red and cyanine (solution 1 : 1,000) 1, 5 to 3 cubic centimeters nitrate of silver (solution, 1 : 20), 15 cubic centimeters ammonia liquor. This solution is employed in the same manner as the eoside of silver solution described under 2).

I furthermore employ the solutions described under 2 and 3 in varying proportion for improving the sensitiveness for any part of the chromatic spectrum.

4.—I likewise employ, in like manner as mentioned under 1, 2, 3, the salts of lead, which produce, when mixed with an eosine dye, eoside of lead, which said salts can be employed alone, or mixed with eoside of silver.

I furthermore employ the insoluble salts of silver, such as the chlorides, tartrates, citrates, &c., dissolved in ammonia or acid. I do not confine myself to any of the proportions of the mixtures as given in the foregoing specification, as the same can be varied according to requirement, without in any way departing from the nature of my invention.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

1. The application and employment of the chemical combinations of silver or lead, with an eosine dye or eosine dyes, for producing highly sensitive isochromatic emulsion or gelatine plates.

2. The application and employment of dyes, known as optical sensitisers, in combination with the salts of silver.

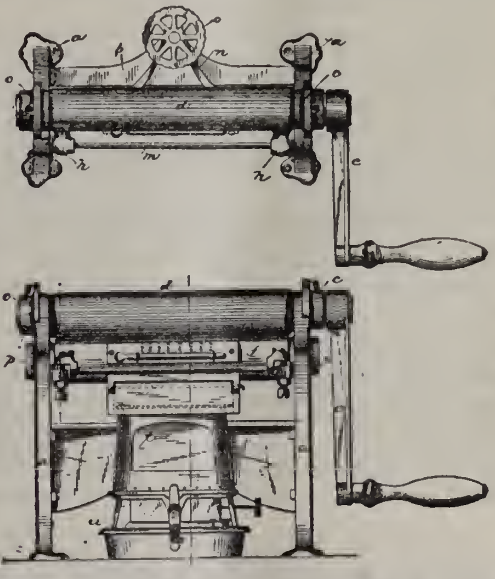
3. The application and employment of various dyes, as mentioned in claims 1 and 2, in combination with soluble salts of silver.

4. The manufacture of combinations or solutions of dyes and silver, as strong optical sensitisers for colouring gelatine emulsions, or as bath for gelatine plates.

5. The application of silver salts not soluble in water, but in ammonia or acid.

Patents Granted in America.

356,399. Warren H. Boles, Syracuse, N.Y. "Photograph-Burnisher."—Filed April 12, 1886. (No model.)



Claim.—1. In a photograph burnisher, a tubular burnishing or polishing tool open from end to end, and having an opening to receive the chimney of the heating-lamp, and a hinged fender or hood to permit ingress and egress of the lamp, combined with such lamp.

2. In a photograph-burnisher, a tubular burnishing or polishing tool open from end to end, and having an opening to receive the chimney of the heating-lamp, and a hinged fender or hood to permit ingress and egress of the lamp, and a stationary fender

co-operating with the hinged fender to inclose the upper end or outlet of the lamp-chimney, combined with such lamp.

3. In a photograph-burnisher, a burnishing-tool provided with fulcral arms and adjustable pivot or fulcrum screws, on which said arms rest, and an intermediate temper-screw.

4. In a photograph-burnisher, the burnishing or polishing tool and a beater therefor, combined with a temperature-indicating device, such as a thermometer.

5. In a photograph-burnisher, the tubular feed-roll *d*, open from end to end to ventilate the same, combined with a burnishing-tool and means to heat the latter.

6. The feed-roll of a burnishing-machine the acting or feeding surface of which is knurled as distinguished from draw-filed.

Correspondence.

THE PHOTOGRAPHIC SOCIETY.

Sir,—In regard to a paragraph which appeared in your last issue, I wish to say that at the last Council meeting of the Photographic Society I resigned my position of vice-president owing to the fact that my list of nominations to fill the vacancies on the Council was not accepted. The Committee of the Council which was appointed by the Council to consider the various nominations, ruled, I believe, that the number nominated must not exceed the number of vacancies. In my reading of the law of the Society which deals with this point, and which you published, I could find no such restriction, and I therefore felt bound to resign my office. I am perfectly sure that my late colleagues acted in all good faith, and I have no complaint to make regarding their action in this matter; but I have a complaint to make against the laws which have to guide the Society, as interpreted by the Council.

The present law worked fairly well when the custom was observed of placing opposite the names of the nominees the names of the proposers in the balloting list, but under the new system, which the Council sanctioned this year, where the names of the proposers are omitted, there is absent all guarantee that the nominations have been carefully considered, since no outward responsibility by the proposer to the Society is incurred.

Acting on this conviction, I sent in a list which contained all the members of the Society who were eligible to serve, wishing not to make it incumbent on members to choose from a small unguaranteed list. The list actually submitted to the Society was a much larger one than usual, owing to several of my friends who agree with me in the matter having each nominated six different gentlemen. I may point out that it would in this manner be easy, in another session, to nominate double or treble the number which appeared on the balloting list at this last election to fill the vacancies on the Council, and to work within the laws of the Society, even as interpreted by the Committee of the Council.

I hold that as in the case of more important elections, the names of the proposers of nominees should be known; and it would be better than this to continue the new regulation that, as is the case in most well-regulated societies, a house-list should be prepared by the Council. Additional names proposed by any member might be printed with this list, the name of the proposer being given.—Yours faithfully,

W. de W. Abney.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—The proposal to alter the standard for rapidity of lenses made some few months since by Mr. Dallmeyer fell so flat, that it would not be necessary to revert to it, but for its being brought forward again in the last issue of the Photographic News, in the form of a table which is calculated to mislead many readers, by leading them to suppose that there would be some greater simplicity in the calculations for exposure if Dallmeyer's proposed standard were employed, than is the case where using the standard selected as such by the Photographic Society of Great Britain.

The photographer who has not made a study of optics will notice that in the table now produced, the figures given under "Dallmeyer's standard" are identical (except in the position of the decimal point) with those answering to relative rapidity; whilst the Photographic Society's standard is represented by figures that are only here and there simple units, and sometimes run away into six or seven places of decimals, and will be apt to suppose that there is a corresponding greater simplicity in the Dallmeyer than in the accepted system.

As a matter of fact, a table prepared with any one standard as a base will show simplicity of relation of numbers for that base, and more or less greater complexity of numeration for apertures and exposures for any other base. Thus with a table prepared on the base of the accepted standard, the stops cut as recommended in relation thereto would bear the numbers 1, 2, 4, 8, &c. each requiring double the exposure of the next, whilst those cut to Mr. Dallmeyer's proposed standard would require an alarming array of decimals to represent them.

When the committee on standards was appointed by the Photographic Society, it included the names of those who were known as practical photographers and practical and scientific opticians. Several standards were proposed. Mr. Warnerke proposed $\frac{f}{2}$ apparently from a mistaken impression, gathered from the way in which the focus was described in the catalogue, that a particular lens of Dallmeyer's was issued of that rapidity. The committee, however, decided upon $\frac{f}{4}$ which has, amongst other advantages, that the numbers marked upon the stops to indicate rapidity do not run so high as they would either with $\frac{f}{2}$ or with Dallmeyer's proposed standard. Several eminent opticians who produce lenses of the very highest class have adopted the Society's recommendation, and issued lenses supplied with diaphragms calculated and marked accordingly.

The usefulness of standards depends to some extent upon their general acceptance, and where once decided upon, and acted upon in the case of many instruments sent out in accordance therewith, it is a pity to inspire doubt and distrust by propositions to alter them unless for some good reason. The new standard now proposed does not appear to possess any advantage whatever, theoretical or practical, over the accepted one, whilst there is an obvious practical disadvantage, particularly to the photographer who wishes to correlate the lenses and stops that he possesses, in having to divide the focus by such an awkward fraction as the square root of ten, instead of by the simple ratio 4. Another practical advantage of the Society's standard is, that its base or unity is represented very closely by a lens which is in the hands of almost every photographer. The Petzval or portrait lens has been made and used in quantities probably largely exceeding all other makes put together, and the relation $\frac{f}{4}$ of its aperture and focus is commonly so closely approximate, that a good idea of the rapidity to which the Society's standard may be referred is very easily grasped. If there were any real advantage in the standard now proposed, doubtless it would be well considered; but the Photographic Society of Great Britain is scarcely likely to stultify itself, and to render obsolete the work of those opticians, who have followed its recommendations, by consenting to merely wanton or capricious changes of standard.

W. E. Debenham.

Proceedings of Societies.

Photographic Society of Great Britain.

A monthly technical meeting was held in the small room, at 5, Pall Mall East, on Tuesday last, the 22nd instant, W. England in the chair.

Some discussion on the paper read by J. B. Spurge took place, but it was considered better to defer the detailed discussion until the next meeting.

W. H. **Harrison** showed a photograph in which the colours are rendered orthochromatically. It was taken by ordinary means, but in the red glow of the evening sunlight.

The best method of packing large plates was then discussed, W. E. Debenham having handed round a plate which had been spoiled by being packed with paper next the film. Dunmore's method of packing the plates in pairs, film to film, and keeping the plates of each pair from shifting by binding the edges with strips of gummed paper, was spoken of favourably.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 17th inst., when J. Hubert read a paper on and gave a demonstration of toning collodio-chloride prints with a sulpho-cyanide toning bath. He also illustrated the application of the process for the production of matt opal pictures, lantern transparencies, and reproduced negatives. Discussion upon the paper was adjourned until the following meeting. Spots appearing on silver prints that had been mounted for some time was a subject which also occupied attention. Sour paste used in the preparation of the mounts was alleged to be the inducing cause by the introducer. The difficulty was, however, variously attributed to bronze powder, lime, and hypo.

Camera Club.

The Thursday evening meeting, February 17th, was a members' lantern slide evening, and some very excellent and unusually interesting subjects were shown.

About 140 slides were exhibited, of which 80 were by F. Dunsterville, a visitor at the Club. These made up a series illustrating scenes and manners in India, and comprised characteristic landscape and architecture, interiors and exteriors of Hindoo temples and palaces, studies of details of the marvellous decorative work on the buildings, and groups and single figures of the natives—hill people, high caste, trading caste, dancing and nautch girls. Notwithstanding the difficulties, and even dangers, presented by the work in India, many of the slides were technically perfect, and, in all, the point of view or study had been most judiciously selected. Altogether F. Dunsterville must be congratulated on having a most interesting and valuable collection of negatives and transparencies, one which might with advantage be exhibited again, and which ought to be seen by other societies.

Barclay and Mason showed views of the Thames up stream, and each included in his exhibit of views one making a charming picture.

F. Sage sent a series of slides representing landscape at and around Bristol, and seascape at Lowestoft.

The exhibition concluded with a selection by J. Gale including picturesque country scenes with figures, also a fine study of barges on the river at Blackfriars Bridge after a snowstorm, in which the result was most artistic, the atmosphere being perfect. Another river scene had been made a most striking picture by the introduction of a magnificent cloud effect.

The subject for the 3rd March will be a full demonstration by the Autotype Company of their carbon printing processes, as shown at their well-known demonstrations at Ealing Dean.

North Surrey Photographic Society.

An ordinary meeting was held on February 16th at the "Greyhound" Hotel, Dulwich, F. **Crosthwaite** in the chair, when a number of lantern slides made by members of the Society were exhibited. The lantern, illuminated with the oxyhydrogen light, was lent and manipulated by Harold Senier (the hon. sec). Slides made by Messrs. Wolff, Crosthwaite, Ince, and Senier, were shown. L. Wolff's slides were fine specimens of camera reductions on the new chloro-bromide plates.

The next meeting of this Society will take place on March 2nd.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

The ordinary meeting was held on the 10th inst., Professor **Herschel** in the chair.

Mr. **Pike**, the hon. secretary, read some "Notes on Orthochromatic Photography," and showed some specimens of work. At a recent meeting, during a discussion on orthochromatism, J. Pike suggested collodion as a solvent for the dye used—eosine or erythrosine. He had since made what he called orthochromatic collodion, with which an ordinary gelatine plate was coated, dried, exposed in the camera, and developed in the usual way; they answered very well, and the plate was rendered more sensitive to gas-light. To get the best orthochromatic effect it was necessary to use yellow glass behind the lens. The gelatine plates used in conjunction with the collodion were the Ilford.

Photographers' Benevolent Association.

The annual general meeting was held at 181a, Aldersgate Street on Monday evening, 21st inst., J. **Traill Taylor**, President, in the chair.

The minutes of the last annual meeting were read and confirmed, and a modification of Rule 3, recommended by the Committee, was adopted.

As amended, the rule stands as follows:—Qualification of members: "Any person connected with photography, above the age of 16, shall be eligible for membership on his or her own application, or on the nomination of a member, subject to the approval of the Committee."

The following were then elected members of the Association:—H. D. Atkinson, G. L. Addenbrooke, J. J. Briginshaw, C. Bere, E. Clifton, F. W. Cox, S. Casbourne, F. P. Cembrano, W. Dallyn, J. Davidson, N. Deves, E. Dunmore, W. Few, J. Greathead, J. R. Gotz, H. W. Gorfin, H. M. Hastings, T. Hadlow, F. Hollyer, A. L. Henderson, W. E. Halse, M. Y. Higginton, B. Lemere, L. Medland, H. Moul, J. Nesbit, W. H. Prestwich, G. D. Plomer, W. D. Richmond, J. B. Spurge, R. Spurr, H. M. Smith, G. Scamell, J. Spiller, J. M. Smith, W. S. Simpson, J. Traill Taylor, M. L. Troup, J. Urie, W. Willis, R. E. Wilkinson, C. H. Watkins, A. L. Watkins, and J. W. Zaehnsdorf.

The **Secretary** then submitted the report and balance sheet for the year ending December 31, 1886, which showed satisfactory progress. Donations to the amount of £27 15s. 6d. had been received, and the annual benefit at the Photographic Society of Great Britain's Exhibition realized £12 12s. 4d. A special lecture given by Alf. H. Burton, of New Zealand, produced £4 17s. 9d., and members' subscriptions £15 2s. 6d. This, with £192 0s. 8d. in hand at the commencement of the year, amounts to a total of £252 8s. 9d. The disbursements were £24 7s. The report stated that notwithstanding the great reduction in the subscription, the large class for whose benefit the Society was founded has not responded to the extent anticipated. Applications for assistance from non-members have been numerous, showing that the reduction of subscription has been a step in the right direction. The members recently elected (over 70 since September last) principally belong to a class unlikely to require aid from the Association, which affords a striking proof of general sympathy with the cause. The Committee solicit the hearty co-operation of all classes of photographic assistants, and wish to bring prominently under their notice the fact that the reduction of subscription necessitates augmenting the numerical strength of the Society at least fourfold. A hope is expressed that the more fortunately situated professional and amateur photographers who have hitherto withheld their patronage, will now come forward and impart that impetus to the Association which it stands in need of. The thanks of the Association are due to the President and Council of the Photographic Society of Great Britain for the special evening at their exhibition. They are also due to Mr. Alf. H. Burton for his able lecture, and to photographic journals for their courtesy in publishing the proceedings of the Association.

The report was formally adopted after a discussion in which several members joined. The election of officers for the ensuing year then took place:—

President—J. Traill Taylor.

Trustees—Capt. W. de W. Abney and Walter S. Bird.

Treasurer—John Stuart.

Auditors—A. Mackie and J. S. Rolph.

Secretary—H. Harland.

Committee—W. M. Ashman (chairman), J. T. Collins (deputy-chairman), W. Bedford, F. H. Berry, T. Bolas, J. J. Briginshaw, E. Clifton, H. M. Hastings, J. Hubert, F. Shea, H. M. Smith, and J. W. Zaehnsdorf.

A communication was received from the Rev. Arthur Tooth, who said: "I shall be glad to express my sympathy and interest in the Photographers' Benevolent Association. We are very much indebted to the men who have worked so successfully and have brought the art to such perfection; and as an amateur I am much indebted for the pleasure I have derived from their enterprise. I suppose it is the intention of your Society to assist photographers who have fallen into distress. I am writing to say that I shall be very pleased to place a vacancy in my orphanage at the disposal of your Committee for a boy from eight to ten years of age, for whom you may be anxious to provide. The boy would be educated under a master, and be clothed; it would be quite free of expense to his friends; he should remain for one year, and at the end of the year you shall be at liberty to ask for an extension of time."

The proceedings terminated with a hearty vote of thanks to the President.

Glasgow and West of Scotland Amateur Photographic Association.

The monthly meeting was held on the 15th inst., when Edward Rodger and D. McCorkindale were elected members.

The President (P. Falconer) gave an interesting demonstration of the preparation and development of collodion dry plates by the "Modified Fothergill Process." He had used these plates twenty-six years ago, and both in this country and in New Zealand he had found that they could be developed with alkaline pyro followed by intensification with acid silver, and with this treatment they were about ten times as rapid as wet plates. With longer exposure they could be developed with acid silver and pyro alone, as in the original process. After the demonstration some excellent transparencies made on these plates were shown in the lantern.

Derby Photographic Society.

The monthly meeting was held on Feb. 8th, J. W. Price in the chair. The question-box was found to contain a considerable number of questions, the discussion and answering of which occupied the greater part of the evening.

A special meeting was held on Feb. 15th for an exhibition of lantern slides, when a large number were shown by C. Merry, J. W. Price, T. Hills, J. Dean, T. Scotton, and H. B. Sykes, and a very instructive and pleasant evening was spent.

Talk in the Studio.

Photographic Enterprise at Cambridge.—Valentine Blanchard, Jun. (nephew of the well-known photographer), has just introduced the electric light into his establishment at Cambridge, the arrangements being on a very extensive and complete scale. The entrance to the studio is fitted up with an arc lamp of about 10,000-candle power, while the reception and dressing rooms are brilliantly lighted with Swan incandescent lamps. The studio is fitted with four Swan incandescent lamps each of 32-candle power, which are used during posing, focussing, &c., the arc lamp, which gives a light equal from 30 to 40,000 candles, being used only when the sitter is actually photographed. The development of the negative is carried on by the light of a Swan incandescent lamp of 18-candle power suitably screened by ruby fabric. The dynamo is worked by one of Crossley's well-known gas engines. Mr. Blanchard finds that six-horse power is sufficient to work all the lamps at one time. By the use of opaque blinds to cover the whole of the glass in the studio, the electric light can also be used at any time during the day.

Finsbury Technical College Photographic Society.—On Monday evening, the 21st inst., this Society was formally opened by the Vice-President, W. A. E. Crombie, in one of the lecture theatres of the College, when a paper upon "Development" was read by the Hon. Secretary, and a short discussion ensued. From a printed copy of the rules, we note that visitors are admitted to the ordinary meetings, which will be held bi-weekly on alternate Monday and Tuesday evenings. Special meetings will also take place. Anyone desirous of reading a paper to the Society will be afforded an opportunity by communicating with the Hon. Secretary, W. P. Dreaper, Technical College, Leonard Street, Finsbury, E.C.

Creases in Prints.—To take the creases out of drawing-paper or engravings when they have to be copied, lay the paper or engraving face downward on a sheet of smooth, unsized white paper; cover it with another sheet of the same, very slightly damped, and iron with a moderately warm flat-iron.

Photographic Club.—The discussion on March 2nd will be on "Cameras."

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

C. Wollaston.—Most likely we have them, in which case they shall be sent on to you in a few days.

Flat Print.—In an album formed of stiff leaves, the print being kept in position by four strips, one across each corner. Only the ends of these strips must be gummed, and it is then easy to draw the print out when required.

Wm. Lang.—Thank you for the information. We have not a notion where the book can be got, but will write to you regarding the other matter.

John McLaren.—The plates are sold commercially, and the address of the firm is Winterthur, Switzerland. As far as we know, there is no agent in this country.

Paco.—A piece of fine muslin, previously boiled in water, and dried, is a very satisfactory filtering material. 2. The cause is doubtful; but most workers agree that moderately quick drying, and a final exposure to a temperature of about 120° F., is favourable.

Iodine.—Sometimes they can be satisfactorily blacked by the use of a bath of sulphide of ammonium, but this has been known to fail.

Member of Committee.—Not unless signed by a name you are known by; also full address must be given, together with place of proposed meeting.

C. W. W. B.—Write to Trübner and Co, foreign booksellers, Ludgate Hill, London.

Brown.—1. We do not know. 2. Pure unbleached wax dissolved in benzole—5 grains to the ounce—answers very well. 3. Probably it is an effect of the gas.

Walter F. Brown.—We have no particulars, and, as far as we know, they can only be obtained from the manufacturers.

E. Askew.—If you write the letters, Indian ink is the proper material to use; but most persons prefer printed titles, in which case our previous directions should be followed. Writing with printer's ink is out of the question, even if the ink is diluted in the way you speak of. 2. It is because you have far too much.

A. Robinson.—Your letter has been handed over to the publishers, who inform us that the numbers are in print, and will be forwarded if you send sevenpence to them.

Maori.—Jabez Hughes' Handbook. See answer to "Amateur" last week.

Photographs Registered.

H. R. Sherborn (Newmarket)—2 Photos. of Prince of Wales and Shooting Party.

Hughes & Mullins (Ryde)—Photo. of Prince and Princess Henry of Battenburg and Child.

The Photographic News.

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For Advertisement Scale see page v.

Advertisements should be forwarded (prepaid) to Piper and Carter, 5, Furnival Street, Holborn, E.C., to reach the office not later than noon on Thursday. A fee of 6d. must be forwarded when the Publishers are expected to receive and forward replies to Advertisements; and when they undertake the receipt of replies, they must be entrusted with the name and address of advertiser, for revelation to applicants, in case they may deem it necessary.

THE PHOTOGRAPHIC NEWS.

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PRINTING COLLOTYPES AT THE MACHINE.

A Visit to Waterlow and Sons, Limited.

FIRST ARTICLE.

Finsbury Stationery Works is the address given, and the large blocks of buildings are so intersected by streets, and are so similar to the adjacent out-buildings of Broad Street Station, that one is a little puzzled at first where to find an entrance; but on following a waggon and crossing a quadrangle, which, if it were deserted and grassy, might faintly remind one of that belonging to the ancient printing house of the Platin family at Antwerp, we arrive at the offices, and are taken in charge by George Sydney Waterlow, the member of the firm who has organized the photographic department. "It is not in here," he says, as he leads us out of the huge, barrack-like building, and takes us to an adjacent street, where a small door within a larger one opens to his touch, and, as soon as we have fairly recovered our eye-sight, we are in a room where three printing machines are at work. They appear, at first sight, to be lithographic machines of ordinary type, but, in reality, they are machines specially made for collotype work; one being made by Schmiers, Werner, and Stein, of Leipzig, and two by Alauzet, of Paris. In fact, these machines do not differ substantially from litho machines, excepting as regards the details of the bed, and a few points which will be indicated.

The glass plate has bevelled edges, and is held in position on the bed by metal holders, rather remotely resembling the catches used to hold curved stereos down on the cylinder of the rotary printing machine. The iron bed can be raised or lowered by very steady and well-made quadrilateral gearing; and by the use of this gearing the pressure is adjusted.

For ordinary work, the quantity of ink required is so small that no ink-duct is required, the machine-minder putting a little ink now and then upon the riders over the distributors. Two sets of rollers are used, both sets being inking rollers. One set consists of leather lithographic rollers, and the other consists of rollers made of a rather hard gelatine composition, this latter set occupying the place of the damping rollers in the ordinary lithographic machine.

We may here state, once for all, that although Waterlow and Sons made no secret of anything, we did not ask the workers to give the details of the formulæ employed; first, because the most successful German operators have published their formulæ; and, secondly, because formulæ have to be slightly varied according to atmospheric and other conditions. It is in the intelligent variation according to needs that the successful collotype operator distinguishes himself. Allgeyer's* formula for collotype machine gelatine rollers is as follows:—Ten parts best quality Cologne glue (sold at some oil shops in Clerkenwell—Aldridge's, at corner of Great Sutton Street, for example) is soaked in water, and then melted in a water bath with three parts of treacle. If the composition is too soft, it must be evaporated in the water bath; and the rollers sometimes require to be exposed to dry air before they will take the ink. The composition should be strained through a sieve before the roller is cast.

The absence of damping rollers is a feature to be noted, the modern system of "etching" the plate being adopted; it is then easy to work off about 200 impressions without further use of an aqueous ink-repelling fluid. The so-called etching of the plate is effected by soaking it for about half an hour in an etching composition having glycerine as its base. The excess is now wiped off, and the plate placed on the machine. After about two hundred runs the machine is stopped and the plate is sponged over with the etching mixture.

Etching Mixtures.

(*a*) Glycerine alone or with a little water.
This is available for plates made with soft gelatine.

(*b*)	Glycerine	500 parts
	Water	500 ,,
	Hyposulphite soda	15 ,,
(*c*)	Glycerine	500 parts
	Water	500 ,,
	Common salt	15 ,,
(*d*)	Glycerine	30 parts
	Nitrate of potassium	1 part
	Water according to requirements.	

The machines are running at the rate of about 300 per hour, and the impressions are fully equal, as far as our judgment goes, to the best work done by machines in Germany, the native home of collotype printing. That work immediately in hand is being printed with a clean edge, so as to give the effect of a mounted print, and this is done by covering the sheet with a sort of mask or frisket of thin waterproof paper; paper made waterproof with a benzolic solution of asphaltum is used in this case. The waterproof frisket sheet is attached to the cylinder of the machine close to the root of the grips, sometimes over the grips and sometimes under. When the grips come to the top, the boy who feeds has to turn forward the frisket sheet, so that he can place the blank paper in position under the grips, and in order to render this manipulation possible, it is necessary that the feed-board should shift at the right moment. In the German machine the feed-board slides upwards, and in the French machine it turns upon an axis near the top.

We can hardly watch the plates on the machine till they break up or wear out, so we question the manager of the department, John D. Geddes, and he tells us that unless a plate is faulty and goes wrong as soon as put on the machine, he expects about one thousand impressions from it, but now and then two thousand five hundred are obtained.

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* Allgeyer, Lichtdruck-Verfahren, fur Hand und Schnellpressendruck. 1881: Leipzig, Karl Scholtze. (The cost of the book is, if we remember rightly, less than 3/6, and it can be ordered of any foreign bookseller.)

In order to make plates which will stand the strain of machine printing, it is necessary to adopt the water glass substratum; the old Albertype method, with exposure at the back, being not only more troublesome as regards the manipulation, but, what is worse, yields films which break up under the strain of machine printing.

Husnik's original formula for the water-glass substratum (a formula strongly confirmed by Allgeyer) is as follows; and the following particulars as to preparing plates are mainly from Allgeyer:—

Syrupy solution of water-glass ...	3 parts
Albumen	7 „
Water	8 to 9 „

To show the variation possible, Allgeyer mentions that the following (also given by Husnik) answers well:—

Water-glass	4 parts
Albumen	10 „
Water	8 „

A few drops of hydrochloric acid may be added when the water-glass is excessively alkaline, but not enough to cause any separation of silica. The mixture is beaten into a froth, allowed to remain at rest for about half a day, and then filtered through a filter previously moistened with water. The ground glass plate is flooded with the mixture, the excess is drained off, and the plates are reared up to dry; and after an interval—say the next day—they are rinsed in water and are ready for the final or printing film.

The plate being now warmed in a drying oven to about 45° C., it is flooded with the following preparation:—

Gelatine	100 parts
Water	1500 „
Bichromate of ammonia... ...	30 „

The flooded plate is now placed upon its levelling screws in the oven and dried.

At Waterlow and Sons' works, the exposure under the reversed negative is often made by the electric light, their electric apparatus being very complete. There is an Otto engine for driving a dynamo of the Siemens type, and a set of storage batteries, which are useful when several exposures must be carried on at the same time, or when it is desirable to work after usual hours.

(*To be continued.*)

PHOTOGRAPHY BY ARTIFICIAL LIGHT.

A little time ago Vogel had a very interesting communication in the *Photographische Notizen* on the subject of photography by artificial light, especially pointing out how readily available the magnesium light now is for portraiture.

Magnesium has been used for about twenty-five years as a source of light for photography, and in the meantime various other kinds of artificial light have been tried with greater or less success. Pyrotechnic compounds were the favourite at one time. Every one must remember the "luxograph" craze that there was some years ago. Electric light then came to the fore, and this light has been used, and is still used, with success by those who can afford the expensive plant necessary for its production. As Vogel points out, it is used not because it produces a better result than can be got by daylight, but because it is available at times when daylight cannot be commanded—for example, in London, where there are so many fogs; and in St. Petersburgh, where the winter days are so short.

Gas was first used successfully for portraiture when gelatino-bromide plates came into use, and it appears likely that with the advent of orthochromatic plates its use may become more general; as there can be no doubt that, in the case of, at any rate, some orthochromatic plates, the exposures to gaslight are very much shortened—in fact, to such an extent that no special appliances in the way of burners are necessary. With some orthochromatic plates that we have experimented with, excellent portraits could certainly be obtained by very short exposures to the light from a dozen Argand gas-burners. By arranging some twenty of these burners in a semi-circle around the sitter, and at a level somewhat above his head, with reflectors behind each burner to prevent the light from passing directly into the lens, and at the same time to intensify that falling on the sitter, very good results could be got—a greater number of the burners being lighted towards one end of the semicircle than towards the other, as required to give high lights and softened shadows. Were the burner at a distance of four or five feet from the sitter the heat would not be excessive, nor would the glare; and the exposures might be from two seconds to half a minute, according to the aperture of lens used.

With orthochromatic plates the difference between bad and good gas is not so marked as with ordinary plates, as the badness of inferior gas, such as we have in London, consists greatly in giving a yellow light, to which orthochromatic plates are sensitive. Indeed, if the plates are used for the sake of getting true colour value, it is a positive advantage to have inferior gas. It comes to the same thing, relative to good gas, as the use of a dark yellow screen relative to a light one.

If orthochromatic plates give gas a chance as a luminant for portraiture, the present extreme cheapness of magnesium on account of improvement in the manufacture gives this substance a chance as well.

Vogel mentions that, using magnesium twenty-three years ago, he had to burn one and a quarter grammes, which cost three shillings for a single exposure. Now the sensitiveness of plates has been increased by ten times, and the price of magnesium has been reduced by somewhat more than ten times, so that the price of an exposure has been reduced quite a hundred times—one halfpenny being now ample to cover it. This, it need scarcely be pointed out, makes the use of magnesium as a regular source of light for studio work, a thing quite possible—indeed, it is doubtful if any other artificial light could vie with it in cheapness.

Vogel gives practical details of the method employed by Haberlandt for using magnesium in the studio as a source of illumination. The arrangement is simply to burn two pieces of magnesium ribbon one on each side of the sitter, the piece burned at one side being considerably longer than that burned on the other side. Thus about $\frac{1}{2}$ meter of ribbon one side, $\frac{1}{12}$ or $\frac{1}{16}$ on the other side, are quantities which have given good results. No special lamp is necessary for the burning of such short lengths of ribbon. To reduce the glare and to diffuse the light, there is placed between each piece of burning ribbon and the sitter a sheet of tissue paper stretched on a light frame of wood. This tissue paper may, if it be thought desirable, be of a blue colour, so that the glare is reduced to a minimum, whilst the chemical action of the light is but little reduced.

Haberlandt has observed that a slight alteration in the position of the screens has a marked influence on the nature of the lighting, and makes use of the fact to vary the effects that he gets. The only drawback to the use of such a means of lighting in that described is that it is impossible to judge of the exact effect in the way of lighting that will be produced, the differences of light and shadow on the two sides of the sitters being the result of variation in time of action of two similar lights, in place of variation in the intensity of light. It is therefore possible to arrive at a suitable effect only by making several trials. We suggest that the effect of light and shadow should rather be produced by burning two pieces of magnesium ribbon of the same length at different distances from the sitter, than by burning pieces of different lengths at the same distance. It would then be easy to produce any effect desired by using, during the posing and focussing, two lamps of the same power as each other, at the places to be afterwards occupied by the burning magnesium. Were they available, a couple of incandescent lamps would be remarkably convenient; but where the current is available for incandescent lamps, it may generally be used for an arc light, and such a light may be preferred to the magnesium, although we think that at the present price of this last mentioned material the fitting up of an arc lamp would probably be a mistake.

Vogel touches on the use of the magnesium light for the photographing of dark interiors, mentioning the curious fact that in two cases, where all the conditions were the same except the decoration and furnishing of the rooms, exposures varying as much as one to sixty had to be given in one case, three magnesium lamps having to be kept burning for 1¼ hour. This, however, is very exceptional. We have ourselves got fully exposed negatives of interiors with a lens working as $\frac{f}{18}$ by burning a couple of yards of magnesium ribbon. Herr Vogel concludes with the pertinent remark, "Once for all, it must be cared for that the direct rays from the magnesium do not fall on the objective."

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THE COMIC SIDE OF PHOTOGRAPHY.

BY CHARLES E PEARCE.*

Continuing our researches through the files of Mr. *Punch*, we came in April, 1859, upon a realistic picture which appeals forcibly to most of us. It is an early drawing by Keene, and represents an old gentleman, whose features the artist has since elevated into a type, lost in the mental and physical effort of trying to look through a stereoscope in a shop window, and suddenly brought to his senses by two frolicsome boys behind, who have purposely come into violent collision with him. "Our friend Mr. Blobbin's stereoscopic studies," says the legend below, "are suddenly assisted by two young friends, who oblige him with an illustration of differing angles." There are few middle-aged people who do not recollect how they used to be absorbed, like Mr. Blobbin, by the attractions of the stereoscope, and could only be made to comprehend they were blocking up the pavement by the forcible language of the impeded pedestrians, or by being bumped against by somebody who did not take the trouble to use any language at all.

The drawing in March, 1860, is also a Keene. It is headed "The Latest Photographic Dodge," and the wording runs thus :—"Artist photographic (to clerical old gentleman) : "Here y'are, sir, c'rrect likeness warranted at this establishment, sir, frame and glass included, and brandy and water always on the table!" This joke is but a variation of the more elaborate drawing by Leech in May, 1857,† and is chiefly interesting because it shows how little Keene has varied his faces during the last five and twenty years. This clerical gentleman is almost the earliest, if not *the* earliest, example of the parson which the public have now been taught always to expect from the pencil of Keene. Why comic artists cannot see the wisdom of going to nature occasionally for a fresh type is indeed a mystery.

A drawing in October, 1860, is both unjust and untrue. The picture bears no signature, possibly because the execution is so bad. Here is the "joke." Photographer: "No smoking here, sir!" Dick Tinto: "Oh! a thousand pardons. I was not aware that——" Photographer (interrupting with dignified severity): "Please to remember, gentlemen, that this is not a common hartists' studio." (Dick and his friends, who are common artists, feel shut up by this little aristocratic distinction, which had not yet occurred to them.)" Where the fun lies in this it is difficult to see. Mr. *Punch* must have been nodding when the drawing was inserted. Leech's drawing, "The Bores of the Beach," in November, 1860, is noticeable from the fac that among the "bores" who are persecuting the old gentleman trying to read his newspaper the itinerant photographer is conspicuous by his absence. He had not made his appearance at the seaside in 1860, or Leech, who had a morbid sensitiveness to minor outdoor worries, would most assuredly have spotted him.

The drawing of the "doorsman" and the two dustmen, by Leech, in a picture which appeared in June, 1861, is inimitable; the quip which it illustrates is very poor. "Now, sir! ave yer cart de visit done," says the doorsman. The only thing to be said in its defence is that twenty-five years ago we were not surfeited with photographic jokes as we have since become. It is too true that nearly all the photographic puns have been made, and the sooner this fact is recognised by jokers the better. Leech is happier when he gets on to his favourite subject "flunkiana." In July of the same year (which, by the way, was unusually prolific in regard to skits on photography), we have a droll picture of a footman showing his photograph to the housemaid. "Why, Tummas," says the delighted Mary, "it's the very moral of yer!" "Pretty thing, aint it," replies Tummas. "Pity the Yaller of the Uniform comes so Black!" The expression on the faces is exquisitely appropriate to the words. The same may be said of the illustration, in November, entitled "The Carte-de-Visite." A gent, one of Leech's delicious creations, is saying to the photographer, "A—look 'ere, you know, mister, I don't want my Cart published, you know, but if any nice gal or lady of rank should want a copy, why you can sell it her!" This drawing shows a curious oversight on the part of the artist, or betrays his ignorance of practical photography. He has put the photographer in a *white* waistcoat—about the last colour one would think of choosing in the days of the wet bath. The drawing (also by Leech) in December marks the period when beards became all the rage. Messrs. Cutts and Longstick, who have suffered much from the difficulty attending the identification of "clients" on their return from a lengthened tour, resort to the accompanying device. Whilst the captain is being measured by the foreman, the junior partner adjusts the camera for his photograph." The camera is concealed behind a desk, the lens just showing through a small aperture. The hairy appearance of the captain is a delightful exaggeration. The skill of the draughtsmanship in an illustration in the Almanack for 1860, showing a cheap swell on horseback in the act of being photographed, saves the threadbare nature of the joke. "Jones prepares a little surprise for his Mary Ann," we are told, "and has his Equestrian Portrait taken." He remarks, "'Ang it, you know, if I do 'ave my carte done, I don't see why I shouldn't 'ave my 'orse." The drawing is worthy of remark, since it shows, the scene being laid in Hyde Park, that the outdoor peripatetic photographer was beginning to assert himself.

The year 1862 was totally barren of photographic jokes, and the next illustration we find occurs in February, 1863, *apropos* of the publication of the first volume of Mr. Kinglake's "History of the Crimean War." The Emperor Napoleon is sitting for his portrait to the historian, who remarks, "Oh! that pose won't do at all. You must be much more in shade"; and put in the shade Napoleon was with a vengeance, as all readers of Mr. Kinglake's brilliant but slightly severe book know. The camera, one notes, is placed on a clumsy tripod stand, an arrangement never seen in the studio. This mistake is repeatedly made, even by present-day artists.

In May, 1863, appeared an amusing article on photographic portraits, introduced just then, about the size of a receipt stamp, "which, being on adhesive paper, may be stuck by way of signature at the bottom of a letter, so that writers may be spared the pains of signing their own names." Mr. *Punch* further remarks : "As people rarely take the trouble to write their signatures in such a way that anyone can read them, the advantage of these portrait stamps is obvious enough, and their usefulness, we think, might greatly be extended if people were to have their correspondence portraits in attitudes to indicate their frame of mind when writing, which naturally varies with each letter that one pens." And then Mr. *Punch* gives a few specimens of the letters and of the supposed portraits, both very clever, but which would require to be reproduced in order to be understood.

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* Continued from page 84.

† See page 84.

It is pretty certain that in 1863 the itinerant photographer was not regarded as an unmixed blessing, and in August, Leech attacks him in a full page illustration. At the top we read, "This is one of the Hyde Park keepers having his carte-de-visite taken," and at the bottom, "And these are the little children who convert the park railings into gymnastic poles to the consternation of Vokin's Horse! (Moral, would it not be better if the park keeper attended to his duties a little ?)"

Leech's drawing in December of the same year must, I fancy, have been a little unintelligible to a good many of the public, and perhaps this was just as well, as it might have shocked the modesty of the prudish, although the picture is really harmless enough. A very sleek lady is posed in front of a camera (the out-door tripod again in the studio !) with her dress tied round where her ancles may be supposed to be, and we are informed that "those who are familiar with the phenomena of the camera-obscura will readily understand the precaution taken by Miss Tabitha Prue, on being focussed for her carte-de-visite.' The absurd notion conveyed in the picture would be readily understood now-a-days when nearly everybody has a smattering of photographic knowledge.

Keene's drawing in December, 1864, is a bit of studio life which most photographers will appreciate. An ugly faded woman, whose face is obviously painted and hair false, extensively crinolined, and wearing that abomination known as a "poke bonnet," is addressing a photographer in his reception room. Old girl: "Oh! I've brought back these cartes of mine, Mr. Kammerer. My friends are very dissatisfied. They"——Photographer : "Dear me, mum, I'm extremely sorry; I thought the portraits very—— Old girl: "Oh! impossible, it's hideous!" Where is the portrait photographer who has not had an experience of this kind ?

(*To be continued.*)

A METHOD OF ESTIMATING THE VALUE OF PHOTOGRAPHIC WASTE.

BY J. DESIRE ENGLAND.

In the winter it is the practice of most photographers to collect together the residues that have accumulated during the year, and send to the refiners, and a ready, and at the same time sufficiently accurate, method of estimating the value at home, will no doubt be of service.

Photographers sometimes complain that they do not get sufficient for their residues, and no doubt they are often justified in so doing, for on two occasions I have received an extra allowance on my complaining to the refiners.

For the method that I am about to describe, it is necessary that the residues be most intimately mixed, and passed through a gauze sieve measuring about 12 to 1 inch. It is better to keep the sulphides apart and treat separately.

The apparatus for the estimation consists of a Fletcher's small injector furnace, taking a crucible of 2½ inches, a blower, and a supply of 2½ inch crucibles. This size furnace will work well with the ordinary gas supply. As the blower is the most expensive part of the apparatus, those who wish to economize may construct one as follows:— Procure a large size pair of hand bellows, and get a turner to turn a ring of wood as large as the top of the bellows. The ring must have a groove running round the outside edge, and a hole bored in the side, just underneath the groove. Cut a hole about one inch in diameter in the top of the bellows, opposite to the underneath valve, then take a piece of leather a little larger than the hole, and fasten it down on one edge over the aperture, so as to form a valve opening outward from the bellows. Now, with glue and screws, fasten the wooden ring to the upper board of the bellows. Fix a piece of tube, about three inches long, in the hole in the side of the ring. Next procure some thin grey sheet rubber, and fasten very tightly with wire over the top of the ring. Now plug up the nozzle of the bellows, and see whether your blower is air-tight. Stop the tube at the side with your finger, and commence blowing. The india-rubber becomes inflated, but take care not to cause it to burst. You will soon see whether the india-rubber remains inflated, after stopping blowing.

The object of the india-rubber reservoir is to obtain a constant, steady draught, which would be impossible with the bellows alone.

If the valve and all joints are tight, attach the short tube at the side of the blower with the burner of the furnace, and having the gas connected, all will be ready to make the trial.

Take exactly one ounce of the dried and sifted residue (paper ash, chloride, and bromide may be mixed), 3 ounces sodium carbonate, and 1 ounce of potassium carbonate ; mix the whole well together on a sheet of smooth writing paper, then place carefully into one of the small crucibles, but do not quite fill it ; if it will not all go into the crucible, add small portions at a time afterwards.

Now light the burner, adjust close to the hole in the crucible jacket, and commence blowing slowly till the crucible is warmed through to prevent cracking. Put the cover on the furnace and increase the heat, regulating it by the gas and air-check. Care must be taken that the contents of the crucible do not boil over. Increase the heat to the full power, and let the crucible remain for five minutes. Tap the crucible lightly with the tongs to detach the small globules sticking to the sides, then cease blowing, turn off the gas, and let the furnace cool down. When cold, break the crucible, and if everything has gone right the metal will be found in a compact button at the bottom, when, having been freed from the flux, it may be weighed. You will then be able to know how much metal your residue contains. If care be taken with the operation, it is capable of yielding accurate results. I have found that the results on two or three trials of the same residue have not varied more than one half of one per cent.

The sulphides are more difficult to reduce. It is advisable to take only half the quantity of residue, heat gradually, and add about an equal quantity of nitrate of potassium ; then add the carbonate of soda, and continue the same as for the chlorides, &c.

The metal from the paper fixing and toning baths and the paper cuttings contain a certain amount of gold which, of course, enhances the value. To estimate the gold, treat the metal obtained from the reduction with nitric acid, which dissolves the silver, and leaves the gold in a state of fine powder which may be collected, washed, dried, and weighed.

PORTRAITURE.

BY J. F. MOSTYN CLARKE.*

The most difficult branch of photography is portraiture ; and not only is it the most difficult to learn, but it is also the most difficult to treat well in words, for the correct delineation of the human form being the highest branch in all the arts, it therefore requires the most skill.

If the beginner have not already a knowledge of the art, nor an acquaintance, somewhat familiar, with the works of painters of note, he will find his own work the easier, it is needless to say better, by studying the celebrated figure-pieces and portraits in the National and other galleries, especially those of the Old Masters, Sir Joshua Reynolds and Thomas Gainsborough. Among the first, Murillo's "Spanish Boy" may be studied for the lighting of a face almost wholly in half-tone, and the management of the high light on the shoulder and cheek, The child in the same painter's "Holy Family" is a beautiful example of the action of a figure ; the lighting in it may also be noticed for the method with which all the surroundings are made to tend to the principal figure. Van Ostade's "Portrait of a Boy" is another picture full of lessons in portraiture. Of the two latter masters, "Portraits of Two Gentlemen," by Sir Joshua, teaches the arrangement of two figures in the one picture, neither attracting more attention than the other, at the same time it being complete as a whole. "Portrait of Himself," by the same, should be observed for the high light. In Gainsborough's "Parish Clerk," the carrying on of the light to the hand and top of the book show the value of balance in light and shade, while the shadows of the face should be specially noted. For the management of background in reference to figure, George Romney's "Parson's Daughter" can teach us much, by observing that it is darkest at the base of the picture, becoming lighter towards the centre, and darker again at the top, thus giving the feeling of atmosphere. Sir John Opie's picture, "Mary Wolstoncraft," is a fine lesson in the turn of a head. And lastly, for figures and landscape combined, "The Vagrants," by Walker, should not be overlooked, as this picture in itself may be said to teach everything. In the landscape the light and shade and lines all tend to the highest light in the distance, while in the figures, the movement and repose, grouping, and the effects of out-door lighting on the faces, should be observed ; while, finally, lines of drapery may be learnt and understood in the standing woman's figure. Also, it should not be omitted to notice the yellow tints of the farthest middle distance placed immediately against the distant blue, that makes the spectator feel the stretch of country lying between, though out of sight—photography may be made to render this effect quite correctly, as blue, the colour for distance, photographs light; while yellow, according to its admixture with other colours, is rendered darker.

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* Read before the Camera Club.

These are only a very few of the works that may be studied ; but, to the writer's mind, they are those most full of teaching, and are specified in the hope that what has been said will guide the beginner to what he ought to study, and to what he should see in each. He will find by close observation how nearly allied in their work are the colours themselves and the shades that represent them ; but to render them truthfully in a photograph great skill is required in the knowledge of their work, and action on the silver salts.

In looking at all good portraits, it will be observed that everything is made subservient to the figure ; not only that, but tending to it ; and in the figure itself all the lights are subordinate to the light on the face, which is the principal object. Hence in the studio the background should be selected very carefully. It is a good plan, if the room be given entirely to work of this and kindred natures, to have the walls papered with some patternless paper of a light-reflecting colour; pale blue-grey is about the best, as it will reflect sufficiently to brighten the side of the figure away from the centre of light, at the same time it will not give a white result with long exposures. Others of different tints, or partly shaded, may be used, being kept rolled tight to prevent creases when not in use ; but these can be dispensed with if the photographer learn to shade the permanent one by using screens in various positions, causing them to throw soft shadows, that will darken it in the proper place without intercepting any of the rays falling on the figure from the centre of light—which should have curtains of some gauzy material for drawing over when necessary.

Now, to make a good portrait—by that I do not mean merely a representation of the sitter's features, but a picture representing individuality—many things are necessary which must be carefully observed and thought about. This can best be explained by reference to the illustrations, practice afterwards giving rapidity to the process.

[The paper here referred to an interesting series of examples sent by Mostyn Clarke as illustrations of the points he wished to emphasize, and concluded as follows]:—

Before proceeding to the question of exposures, a few words may be said on the subject of the proportions of the boundary lines of pictures, which are, in some cases, the actual frame. It will be enough to suggest the two following facts, resulting from observation, leaving you to reason and apply them for yourselves.

The length and breadth of the frame must be relatively proportionate to the length and breadth of the figure shown.

The distance between the top of the frame and the highest point of the head will be found to decrease, and that between the side of the frame and face (on the outlooking side) to increase proportionately as the length of the frame increases over the breadth and *vice versâ*.

By the word "frame" in the above is meant the boundary-line of the picture itself, and not the outer frame.

The exposures necessary for portraits taken in a studio such as that described, cannot be otherwise than protracted ; therefore it is well to choose such positions as will be the least trying to the sitter's powers of remaining at rest.

The reason, as before stated, for this great length of exposure is, that without it we should have no broad sweeps of light and shade, but rather patchy results. For the exposures of portraits out of doors, a shorter time is required—about five to ten seconds, according to the state of the light and the time of day, the light being strongest from about eleven until two o'clock, and considerably weaker after three o'clock in summer. A good idea of its varying strength can be obtained by the beginner experimenting with sensitised paper at various hours. As to the stops to be used for portraits in the studio, a medium has been found to give the most satisfactory results, as this size does not protract the exposure, while it keeps the high lights under control. For outdoor portraits, the rules are the same as those for landscape.

ON THE COMPOSITION OF THE PICTORIAL.

BY NORMAN MACBETH.*

The composition of that which is calculated to be made pictorial depends very much on the taste, aptitude, and culture of the mind who desires to pursue it. It takes much time and application to those who are well read on the subject of art to put this into practice, for without a fine sense naturally of that which is picturesque, there arises much difficulty in the selection of subject. However, when that is present it is gratifying to state that with a knowledge of leading principles, and the methods of employing them, the difficulties very soon disappear. The photographer has many advantages over the draughtsman, because when once he knows the proper standpoint to view the subject, nature, reflected by the camera, greatly assists him in the arrangement, whereas the draughtsman has to gather it all by his own mind and put it up besides. Certainly he has advantages again over the photographer that he can reject at his pleasure that which does not suit his arrangement, but, on the whole, it is much easier to compose by the assistance of the camera than it is without it. Never forget that the first essential is a feeling after the picturesque and what is really beautiful in nature, then comes the desirability of the art, by which one is able to select, separate, arrange, and present that which is most valuable, beautiful, and impressive. It is to a knowledge of this, then, that I ask your especial attention.

The great properties of a subject in its treatment are balance of interest, but not equal in importance—being diverse in character, but always in unity—the principal part, such as a head, taking the lead, and the rest of subject matter following in expressiveness, in strict relation to each other, no portion unoccupied, and yet no redundance. The more variety one can render in the treatment, the more does it bespeak his knowledge and inventive power.

The importance of the limit or bounds of the subject, called the boundary lines, I now call your attention to.

Why is it that pictures are not constructed with the breadth and length of them being equal? My reply to the question is, You never see a picture in any exhibition so bounded, unless it be when a circular form is enclosed. Such pictures are unavoidably too much concentrated, consequently limiting diversity of arrangement; and the reason why lantern slides are so constructed is, because they serve the purpose of diagrams generally employed in scientific illustrations. But a diagram is not a picture, although, unfortunately, the square form of the ordinary lantern slide has been used in the exhibition of scenery, yet the subject should only have the boundary line suited to it visible ; without this special limit to the subject it has not its peculiar attribute that defines the picture. This, I trust, will be fully demonstrated in the slides to be exhibited to-night.

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* Abstract of an address given at the Photographic Club.

[Here followed the projection of fifty-eight pictures on the screen, each of which was accompanied by critical remarks, which would not be understood without the illustrations; after which Mr. Macbeth continued.]

Some have strong views in favour of naturalistic production only being attempted—*i.e.*, taking nature simply as you may find it. They are very jealous of rules of art, regarding them as the conventionalities of schools. Well, if anything does give a true rendering or reflection of nature as it is at the moment, it is photography. But, as you see every day in the attempts of beginners, there is little concentration of the subject, and no variety of treatment to make it interesting, consequently you must have recourse to some method in order to govern and regulate the subject, otherwise it stands a bad chance of being a picture. Imagine anyone sitting down to a piano and rattling over the keys at any rate—what kind of music is that? As in the art of speaking or writing a language, a grammar must be introduced in order to regulate words and sentences.

It is a difficult thing to subject the rules of picture-making to the requirements and capacity of photography. It is a branch of study meeting the claims of science as much, and fully more so, than that of art. To embrace the latter, the claims of art require much care and scrupulosity in what is introduced for its treatment. The tendency of photography in making application of art (especially the canons of fine art) is, that it attempts too much beyond its province and power. It is mainly a mechanical art, and very dependent on the instrumentalities and means for carrying out its designs—means and appliances not common to any other art—so that thereby its simplicity and purity are greatly endangered through the attempts of many who find the development of a plate otherwise easy.

In my former lecture I alluded to the attempts of building up a composition from various pieces of other negatives than that on hand, and which may have been taken for the very purpose. I hold that it is hardly legitimate to do so, inasmuch as the method is not only not so satisfactory as those otherwise gone about by the arrangements of actual objects made in the studio, with figures and accessories so placed so that you can ultimately photograph the whole subject in a completed state, but to have recourse to such a bolstered method with separate pieces, I think, is very unworthy of being allied to the higher associations of fine art. It has been asked, If artists do so, why may not photographers? I presume when it is said that artists do so, it is meant they make studies from nature and apply them to a subject? Certainly they do, and without this application it is not to be expected they can do much if left to their own resources. Neither can the photographer. I wish him to make as many studies as he possibly can, try them in every advantageous way, then, when thoroughly conceived and designed, work out the subject on an actual field, either within or out-of-doors, and then photograph the same in its completed form. This is, I conceive, the legitimate province of photography, and it should be carefully conserved. I do not object to any contrivance on that field, provided it is worthy of the subject, for nothing that is vulgar or mean in character should be tolerated for a moment. It is the exercise of a fine taste, as well as fine arrangement, that will elevate and ennoble such efforts. No one who knows the deep interest I have all along taken in the history and practice of photography, and especially in fostering and protecting the art element in association with it, but must feel that I can have no antagonism to what I conceive to be a legitimate pursuit of it; but as to the method that is often resorted to in working out a composition by separate composite parts, I have very strong convictions against it. Very few who have attempted it have succeeded in concealing their contrivances, and have forgotten the old saying, "Ars celare artem." The main tendency of such a method is, that the terminations of each part do not sufficiently blend with the parts in juxtaposition, consequently they appear not unlike the side-wings of a theatrical stage. I cannot understand why the simpler method to which I have alluded should not be attempted more. Perhaps it is for the want of accommodation, as such work would require a room for itself. Those who have outdoor accommodation would succeed admirably, and would well repay them for their pains, working out simple studies under the effects of natural light, either in direct sunlight or diffused. I am satisfied in my own mind that by this means you would successfully cope with the arrangements of higher art, provided you are able to control and regulate the action of your figures. The main dependence you have, after your own knowledge, is the feeling that you are able to infuse into your characters in carrying out your designs.

I have never yet seen, nor read of, any distinct definition or limit of the province of photography in relation to its application of artistic work, which it professes to take up. So far as I can make out, from what I see in its operation, its lies between the art of painting or drawing, and dramatic or stage art. The former is called a fine or creative art, because of its influence to be entirely at the disposal of the artist, entering upon the treatment of his subject by choosing and rejecting at his pleasure that which is most suited to his necessities and wants, entering also into such niceties of feeling, subtle and delicate, especially in manipulation of drawing and colour. Some of these arrangements may be done by the photographer, but his power is comparatively limited, owing to his dependence on the lens (which draws for him). What he must do is the exercise of his judgment of the stand-point of the camera, construct his arrangement of subject, and develop. This is a great deal, but beyond that he is walled in. It is not his province to paint, neither on the negative nor on the print (excepting for defects purely incidental); the moment he does so he leaves his domain, converts his work into a mongrel, and renders his special art impure. It was certainly a retrograde movement when photography had recourse to the brush and other instruments (to meet the wishes of a vain and ignorant public). by touching up and remodelling the human face, destroying much that is valuable in likeness and character, making the production no longer authentic or valuable for reference in years afterwards.

Photographic art is distinguishable from all others in that its representations are, and ought to be, pure reflections in their ultimate issue, not manipulations; and the only credit the photographer can take, so far as art is concerned, lies in the skill with which he can conceive and arrange pictorial effects, apart from appliances beyond his sphere, such as the manipulation of composite negatives.

These are my views on this part of my subject regarding legitimate means for constructing pictorial effects and arrangement. It may be considered a mere matter of taste and opinion which I set as to the *modus operandi*. Well, I have given my reasons, and reiterate that I wish to see photographic art clearly defined from other branches, that no means be employed to lower the worthiness of what I conceive to be legitimate artistic effort, and that its special art, by simple reflection, be kept pure and as severe as possible.

I have no objections to any treatment by light on the subject proper, or on prints. This is analogous to the methods employed by the printer of etchings. There is the etching proper; but, by the skill of the printer, under the direction of the etcher for completed proof, he shades certain parts by more ink being left on the surface, or keeps other parts very clean where brilliancy is required. Much may be done towards such an end in photographic printing—and, I have no doubt, is done—which I regard as legitimate work, because it is done purely by light.

Although double printing is almost universally employed, still I regard it as a do-no-better. The want of some appliance was felt when clouds and landscape could not be taken simultaneously; but now that sky-shades can be adjusted to the lens, so thoroughly controlling the light on the sky while the landscape is being exposed first, everyone must feel that double printing is unnecessary. Certainly it is very tempting for composition purposes, that by choice cloud effects you can introduce lines that have a beneficial effect in composing with the landscape, yet all this is a part of the same cobbling which I complain of, and infinitely better would it be were you to bide your time and catch favourable clouds as they appear in conjunction with the landscape. Should you be pushed for time, and no clouds present when the plate was exposed, then, when the subject is printed, tone in, and graduate a sky by the influence of light over the surface, which would represent and give the feeling of a pure sky. It is to be feared that much of the indulgences in extraneous appliances is the result of doing the work by the easiest methods, irrespective of truth and taste. If there be difficulties in any department, let us fight with them, and not resort to spurious methods because they happen to be easier or more convenient.

I have always regarded photographic art and its requirements as being more allied to dramatic art than to that of fine art. For the construction of a scene, having several figures in it, see how carefully the arrangements of them have been made, each individual, each group of figures, varying in position and action, and this every night reproduced, because the subject has been fully felt and understood. I do hope the day is not far distant when stage effects may be photographed. Indeed, it would be worth the effort if rehearsals were made in the open air, under sunlight, and during the course of action instantaneous impressions taken; it would not only be valuable and serviceable for actors, but for all interested in dramatical and pictorial art.

In conclusion, let me earnestly urge upon all desirous of entering on this study, either from external nature or the human figure, to begin by making simple efforts on the principle of these *forte* points which I have illustrated. Have the camera focussing glass divided into odd numbers, and very soon you will be able to discover their value and suitableness to any subject.

COMPOSITION IN PHOTOGRAPHIC PICTURES.

BY J. WELLS CHAMPNEY.*

Let us speak of form in the relation of lines to one another and the masses of black. The pyramidical tent there ought to be broken. The long line carries your eye across the lake. The descending line of the hill is a very pleasant one.

The black mass of the trunk gives value to the scene. There is a very exquisite foreground [indicating], full of gradations as you see. Now I will take the top of that out and see if it is pretty.

An upright might also be made of that picture.

Mr. Roosevelt—You can't do anything with that, sir, unless you pull that tent down.

Mr. Champney—I find great beauty in that, even with the ugliness of the blank space of the tent.

[A new scene representing a stream surrounded by lilies and wood was then shown.]

Mr. Champney: Now this composition is pleasant because it has a very interesting foreground of leaves, but you cannot see them because of your landscape, or rather you cannot see the landscape because of them. That would be the argument I would make; and again, the repetition of the form on the left of those trees duplicated so perfectly in the water is another element that is disagreeable.

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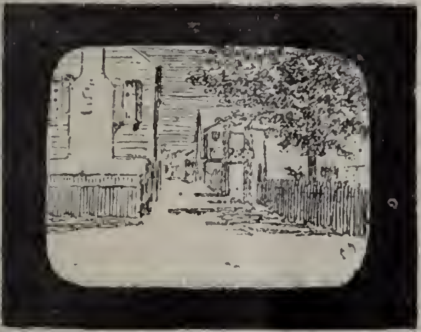
Let us change it and have more water and less sky.

Now that is very lovely from another standpoint, and really to my mind it is the best. You have now the full value of a clear sky; the repetition of that sky in the water; a suggestion of a very interesting foreground; and a lovely group of trees.

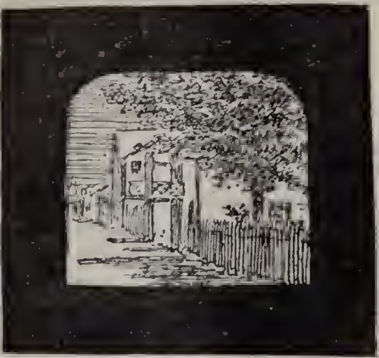


[Another scene was then thrown on the screen of a street scene in St. Augustine, Fla., as above.]

Mr. Champney: Here is a puzzling picture. It is an architectural scene, and presents a strong contrast to the ones we have already had. For that scene I have prepared two mats. If one is to send that picture abroad to represent the variety of architectural, let it go as it is; but if one is to keep it for one's self because of any architectural interest in it, I would like to name the object of interest, and that is the view down the road. Placing mat. That is, to me, very pleasant and agreeable. There is no waste of space. I remember that old street which you see there with its Spanish balconies. I think we could sacrifice more, and so I am going to present to you this form as meeting still better the requirements of composition.

[Showing the same view as altered.]

Now if you will compare it with the one shown before, you will see that we make our shape play an important part in the composition. We get, as you see, a little bit of white coming down on the frame. In one case the masses are white and the sky blue. If I were sketching that, that would be the selection I should make.



There is an interesting photograph of the boat *Ticonderoga* on Lake George. That line of the sky above and the water below will give you a sense that that vessel is on a flat surface.

[Changing mat.]

Now, as the picture of a steamer it seems to me it serves the purpose better than when you are bothered by your interest in their waves. In every way it seems to me to be an admirable composition. The man who took it evidently knew when he had a good thing.

A Member—If the clouds above were darker, would it not make it a little better?

Mr. Champney—I think not. The sky as it is, is suggestive of the floating masses of vapor, and the steamer coming up against the same forms a very charming picture.

A Member—I mean to develop it longer, and thus bring the clouds out more distinctly.

Mr. Champney—I think the object in making that picture was not to call attention to the clouds. The picture is one of a steamer in motion, and the sense of movement and progress and resistance against force is admirably given, and the balancing of the smoke-stack and the piston rods and component parts of the structure of the steamer is very admirable.

[Several landscape views, which illustrated the principles of good selection, were thrown upon the screen and commented upon. Amongst others a landscape with road.]

Mr. Champney—How charming the outline of the trees against the sky; how the winding road carries the eye into the picture; and how admirably the architectural forms on either side balance one another. Whenever two elements in a scene conflict, one must be sacrificed if possible.

[A river scene followed.]

Mr. Champney: There is a little too much sky, otherwise it would be charming. As much as one-third of the picture can be cut off.

[A picture of a palm tree was then thrown on the screen.]

Mr. Champney: Now there is a case where a large amount of white is not unpleasant, because any of you who have been in the South know that that meaningless area of sky is one of the memories of the trip. Those cloudless days which you see in the South are very truthfully represented by that sky. There is no contrast in the light and shade. In all these cases the conventional mat serves our purpose. I think these are all very good pictures, but of course changing them with these mats in some cases, in my opinion, enhances their beauty. I think our English friends ought to be pleased with what America has to offer them.

Note.—The diagrams which are used in this report to illustrate the principle at issue, do not convey any idea of the beauty of the lantern slides, and may thus fail of their purpose to explain the reasons for certain changes which were apparent to those who saw the original views with the changes produced by the alteration in form of the mats. But five have been made, as these were considered enough to force attention to the subject.

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* Continued from page 46.

Notes.

Photography has an unhappy knack of destroying one's illusions. A case in point may be seen just now in a series of photographs illustrating the evictions at Glenbeigh, hanging in the window of the *Dublin Freeman's Journal* office in the Strand. There is no illusion about the wretched hovels burnt by the evictors—these are shown plainly enough—but what strikes an English eye as curious is that the Irish peasant is totally unlike the conventional notion of what an Irish peasant ought to be. He does not wear knee breeches, he has not got on the frieze coat with the long tails, no cawbeen is on his head, and not a fragment of a dudeen is to be seen anywhere. His attire is as commonplace as that of any English navvy—indeed, it much resembles the English dress; ordinary trousers, ordinary jacket, ordinary waistcoat, and an ordinary felt wide-awake. The photographer should have rigged the figures up like stage Irishmen if he had wanted to impress the cold English public.

A story is told of one of the partners in the Pears' soap firm who had his photograph taken in a London studio, and, wishing to appear as reading a newspaper, he took one up in a hurry and posed himself. On seeing the copies, he was surprised to find the most prominent thing about the picture was a gigantic advertisement of Pears' soap, which filled the side of the newspaper next the camera. The operator noticed the state of affairs, but, knowing the advertising proclivities of the Pears' soap firm, said nothing. A re-sitting was, however, given, and this time another newspaper was taken. We do not vouch for the truth of the above story.

Does not this idea open up a possibility of profit both for the enterprising advertiser and the enterprising photographer? By an arrangement with the former the latter might be able to afford to take portraits for *nothing*—on condition, of course, that the sitter holds a newspaper displaying an advertisement, and that he does not object to have his photograph exhibited in the show-case. The artist who painted the picture of A. M. Broadly in the Institute has gone very near to this, and has devoted quite as much pains to the reproduction of the outside sheets of *Punch* and the *Illustrated London News* which forms a portion of the multifarious properties by which the unfortunate Mr. Broadly is surrounded, as he has to the face of his sitter. It is true he has softened the advertisements, but this is a pity, as he missed a great opportunity of showing what could be done in the way of realistic art.

Great use is made of photography, according to an evening contemporary, to palm off to unsuspecting purchasers spurious antique armour and weapons for genuine ones. The centre of the manufacture is Germany, the numerous castles which there abound coming in very handy to assist the fraud. The dealers secure an old building, fit up a chamber with mock antique swords, spears, battle-axes, breast-plates, helmets, and what not, and have the whole photographed. The photographs are forwarded to wealthy collectors, who, believing "there is no deception," are often taken in by the genuineness of the surroundings, and become purchasers of absolute rubbish. The *modus operandi*, save as to the employment of photography, is not novel, for years ago tourists in Italy were continually being "had" by skilfully-told stories of a certain valuable Titian or Coreggio, stowed away in a country mansion, the owner being quite willing to sell the picture in question for a trifle, as he was quite ignorant of art, and had not the least idea of the treasure he possessed. It is unnecessary to say that the vendor invariably knew too much for the buyer.

In an interesting historical article on astronomical photography, A. A. Common, in the *Nineteenth Century*, advocates (failing the establishment of as many private observatories as possible) the establishment of an observatory especially for photographic work. The requirements for such an observatory, Mr. Common states, would include a reflecting telescope of the largest possible size, of silver and glass, for special work on nebulæ; a large enlarging telescope for lunar and planetary work; and beyond these, provision might be made for stellar photography, and for spectroscopic work. Mr. Common suggests three ways by which the cost might be defrayed—by subscription, private enterprise, or by a Government grant. The latter suggestion, we fear, will never be realised.

Photography was the subject matter of a farce called "The Three Years System," produced last week at the Crystal Palace. The story, such as it is, may be told in a few words. Two briefless, impecunious barristers purchase a camera on the three-years system, and go in for a photographic business. Their first customer is a young gentleman, very much in love, who wants his portrait as a present for his sweetheart. For some reason which was certainly not apparent to the audience, they persuade him to don a classical costume, and be photographed, much use being made of a pitchfork which they adapt to the purpose of a head-rest. This is the beginning, the middle, and the end, of the plot, which, as may be imagined, furnished very poor fun.

M. Marey continues, in the last number of the *Comptes Rendus*, the details of his experiments in photographing the flight of the gull. In his first article on the subject, which we noted a fortnight ago, he dealt only with the flight projected upon a vertical plane parallel to the axis. In his second he gives diagrams of the flight projected obliquely, and also projected upon a horizontal plane. His method of obtaining the last named he thus describes: "Four high beams of wood firmly fixed in earth, and solidly connected together, gave me a pyramidal framework about fourteen metres in height, and accessible interiorly by means of ladders. Then upon other oblique beams I placed a horizontal flooring, suspended twelve metres above the ground, and installed there the photographic apparatus, with the lens turned downward. Then, to form a dark background below, I stretched upon the ground a band of black velvet, eleven metres long and 2·5 wide, upon which opaque screens projected their shadows. I thus obtained a dark field—very imperfect, doubtless, but sufficiently near to give legible images." M. Marey hopes, with the assistance of a series of models of the bird representing the successive attitudes shown by those three projections, to obtain the perfect representation of the movements of the wing, and generally all the ideas relative to the science of movement in flight.

Photolithographs in half-tone are now becoming tolerably common, and one constantly finds advances in this direction. W. D. Richmond, of 18, Sparsholt Road, N., the author of the well-known standard book, "The Grammar of Lithography," shows us some of his work, the grain being fine, almost like that of a collotype. He has, we are told, already supplied stones to some of the large lithographic printers in London. Other examples of this class of work come from L. W. Einthal, of Port Elizabeth. His grain is rather coarse, but the effect is good, and other things being equal, a coarse grain is easier to print than a fine grain.

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.

Chapter III.—Some Pioneers of Photography.

Claims of Charles and of Boulton.—The discovery of photography, altogether or in part, has been claimed for at least two men, who attained distinction in science towards the end of the eighteenth century. It has been stated that Professor Charles, who was well known in Paris as a lecturer on chemistry and physics about the year 1780, not uncommonly (as a lecture experiment) obtained profiles of the heads of his students by placing them so that the required shadow of the features was cast by a strong beam of sunlight upon a sheet of paper coated with chloride of silver. As the light would discolour that portion of the paper upon which it fell, the result was a white outline of the face upon a black background. But this statement is a mere tradition, and the best authorities have considered it "too vague and improbable to be taken into serious account."

Some twenty years back, an attempt was made to prove that Matthew Boulton, the partner of James Watt, was acquainted with a method of producing photographs, at least as early as 1777. But the numerous pictures which about that date were sold by the famous Birmingham firm of Boulton and Watt were executed by a mechanical process—possibly aqua-tint—the invention of an ingenious artist, Mr. Eginton, who was then employed at the great Soho factory. These pictures were of large size, as much as five feet by four, and were coloured. In a series of pamphlets published in 1864-5, Boulton's grandson clearly proved that photography had nothing to do with the production of these pictures. Living in that district of Birmingham where Boulton and Watt did their work, we have carefully studied this question, and can endorse the conclusions arrived at and very ably stated by the younger Boulton.

Copying by Sunlight—Wedgwood and Davy.—With the dawn of the nineteenth century all things were propitious for the rapid advancement of matters scientific. Great progress had by this time been made both in chemistry and in optics; while the art of experimenting—the knowledge of how to question nature—had become familiar to many men of talent and education. Thomas Wedgwood, fourth son of the great potter, earnestly studied the action of light upon certain compounds of silver. He was encouraged and assisted by Humphry Davy, then just rising into fame as a chemist, and after Wedgwood's death Davy wrote an account of their work, which appeared in the *Journal of the Royal Institution* for 1802. Wedgwood's best results were obtained by coating paper or white leather with a weak solution of silver nitrate. The more or less opaque object which it was desired to copy was then placed on the prepared surface, and the whole exposed to sunlight. In a few minutes the unprotected portions of the paper were darkened, and when the opaque object was removed, its form remained in white upon a black ground. Paintings on glass could be copied in this way, the light passing through the transparent and semi-transparent portions, and blackening the sensitive paper placed underneath. Wedgwood noticed that "red rays, or the common sunbeams passed through red glass, have very little action upon paper prepared in this manner; yellow and green are more efficacious, but blue and violet light produce the most decided and powerful effects." These facts had been previously published by Scheele and by Senebier, but Wedgwood does not appear to have known of their work. The scantiness of scientific literature at that time, and the difficulty of communication between different countries, were indeed great hindrances to progress. The workers in any one country were usually ignorant of what had been done elsewhere; so that the same track was pursued again and again, and the same discoveries made several times over. Davy made some important additions to Wedgwood's work. He found that the chloride was much more sensitive to light than the nitrate of silver. Both Wedgwood and Davy attempted to secure the pictures formed by a camera, upon paper coated with these salts of silver, but without success. Davy, however, using the more concentrated light of the solar microscope, readily obtained images of small objects upon papers prepared with silver chloride.

But there was another and more fatal objection to this method of "picturing by light," which not even Davy, with all his chemical knowledge, was able to surmount. When the copies obtained were exposed to daylight, the same agency which had produced the picture proceeded to destroy it. The action of sunlight upon the white or lightly shaded portions constituting the picture speedily blackened the entire surface of the paper or leather, causing the whole to become of one uniform tint in which nothing could be distinguished. To prevent this it was clearly necessary to remove the unacted-on silver salt after the image had been formed, and before the paper was exposed, as a whole, to daylight. Long-continued washing in water was tried, but proved ineffectual; nor was a coating of transparent varnish found of any service. Davy does not seem to have pursued the process with much energy, and the whole thing dropped into obscurity. Still he clearly recognised its capabilities, for he writes: "Nothing but a method of preventing the unshaded parts of the delineations from being coloured by exposure to the day is wanting to render this process as useful as it is elegant?" In this copying process, devised by Wedgwood and improved by Davy, we see the germ of the ordinary method by which our negative photographs on glass are made to yield a positive proof or impression upon sensitised paper.—*Photographic Times.*

MEASURING DENSITIES OF PHOTOGRAPHIC DEPOSIT WITH REMARKS ON SENSITOMETERS.

BY CAPTAIN W. DE W. ABNEY, F.R.S.*

There are some variations made at times which I will now indicate. Sometimes it is desirable to modulate the bright field, and this I do by replacing the condensing lens L, by a piece of ground glass. I also use diaphragms to the lens L,, for the same purpose. In fact, it is almost essential to use some diaphragm, to prevent the shadow of the rod having blurred edges. The method of measuring I adopt is to insert in L,, a diaphragm of such a size that, when the sector wheel W is open to 90° and rotated—that is, when it has a double opening of 90°, when half intensity of the comparison light is used—the shadow of the rod illuminated by it shall be slightly brighter than the shadow of the rod cast by the light coming through the lenses, and when it is unshaded by any photograph. When the shadows are equalised, the aperture of the wheel is noted, and is the standard to which all other light is reduced. In all determinations three or four readings should suffice when the observer is fairly expert, and they should not differ more than a degree from the mean, and will probably differ less. (It should be recollected that small differences in intensity are much more readily judged when the light is not too strong, say the light cast by a candle four feet off.) The bare glass plate, with gelatine on it, is next measured, and then the densities of the different parts of the plate. (I may say that I am in my description here carrying in my mind the idea of measuring a plate that has been exposed to a sensitometer.) When the densest parts are under measurement it is very probable that the illumination will be insufficient, and the opening of the rotating wheel become very small. When it reaches 10° it is better to make another departure. More light should be admitted to the screen by using a much larger diaphragm in the projecting lens L, ,, and the measurements be recommenced by finding which square of density requires nearly 90° opening; and then, measuring to the densest parts again. By this means it is quite easy to read the density of a very nearly opaque square. The annexed table gives the measurement of a plate which was exposed in a Spurge's sensitometer, and developed with ferrous oxalate. The plate was a matt looking plate before development. and it will be seen that the gelatine retains the matt after development.

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* Continued from page 90.

						Mean.
Naked light	60	58	58			59
Glass and gelatine	42	42	41			41½
Square No. -2	40	41	40½			40½
,, ,, -1	39	39½	39			39
,, ,, 0	37	38	36			37
,, ,, 1	35	34½	34	35	35	35
,, ,, 2	33	32	33	31	31	32
,, ,, 3	28	28	28			28
,, ,, 4	24	23½	24			24
,, ,, 5	20	20	20			20
,, ,, 6	16½	17	17½			17
,, ,, 7	15	12	13	14		13½
NEW READING.						
Square No. 3	82	82½	81			82
,, ,, 4	70	71	72			71
,, ,, 5	62	61	60			61
,, ,, 6	52	48	52	50		51½
,, ,, 7	39	39	40	42	41	40¼
,, ,, 8	29	29	31	30		29¾
,, ,, 9	20½	22	22½	21½		21½
,, ,, 10	17½	16½	17			17
,, ,, 11	12½	11½	12			12
,, ,, 12	10½	10	10½			10⅓
,, ,, 13	7½	7	7½	8		7½
,, ,, 14	6	5½	5½			5½
,, ,, 15	4¼	3¾	4			4

To find the co-efficient with which to multiply the first reading to bring it to the same scale we get—

Square No. 3 ... $\frac{82}{28}=2{\cdot}92$

,, ,, 4 ... $\frac{71}{24}=2{\cdot}96$

,, ,, 5 ... $\frac{61}{20}=3{\cdot}05$

,, ,, 7 ... $\frac{51\frac{1}{2}}{17}=3{\cdot}03$

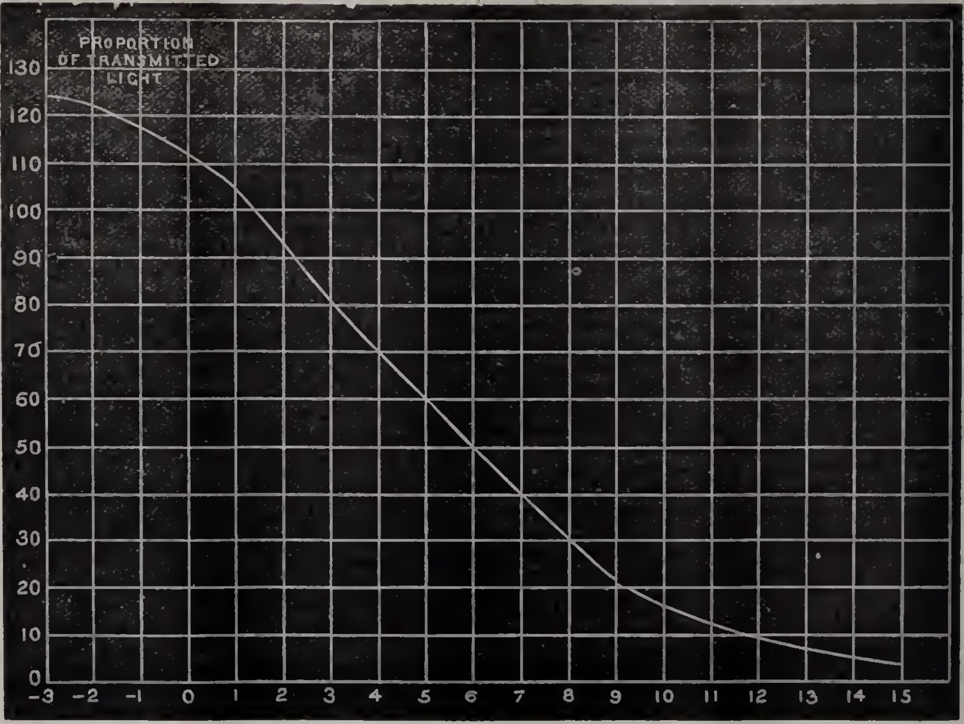
,, ,, 7 ... $\frac{40\frac{1}{4}}{13\frac{1}{2}}=2{\cdot}98$

$$\text{Mean} = \frac{14{\cdot}95}{5} = 2{\cdot}99$$

For our readings we may use 3 without sensible loss. Our final curve for relative densities becomes—

	First Reading.	Second Reading.	Adopted Reading.
Naked light	177*	—	177
Glass and gelatine film	124½	—	124½
No. -2 square ...	121½	—	121½
,, -1 ,, ...	117	—	117
,, 0 ,, ...	111	—	111
,, 1 ,, ...	105	—	105
,, 2 ,, ...	96	—	96
,, 3 ,, ...	84	82	83
,, 4 ,, ...	72	71	71½
,, 5 ,, ...	60	61	60½
,, 6 ,, ...	51	51½	51¼
,, 7 ,, ...	40½	40¼	40¼
,, 8 ,, ...	—	29¾	29¾
,, 9 ,, ...	—	21½	21½
,, 10 ,, ...	—	17	17
,, 11 ,, ...	—	12	12
,, 12 ,, ...	—	10½	10½
,, 13 ,, ...	—	7½	7½
,, 14 ,, ...	—	5½	5½
,, 15 ,, ...	—	4	4

Putting this table another way, it means that the light in passing through the various parts is dimished by so many 177ths, thus—



No. 1 square allows $\frac{105}{177}$ of the total light to pass.

No. 2 square allows $\frac{96}{177}$ of the total light to pass.

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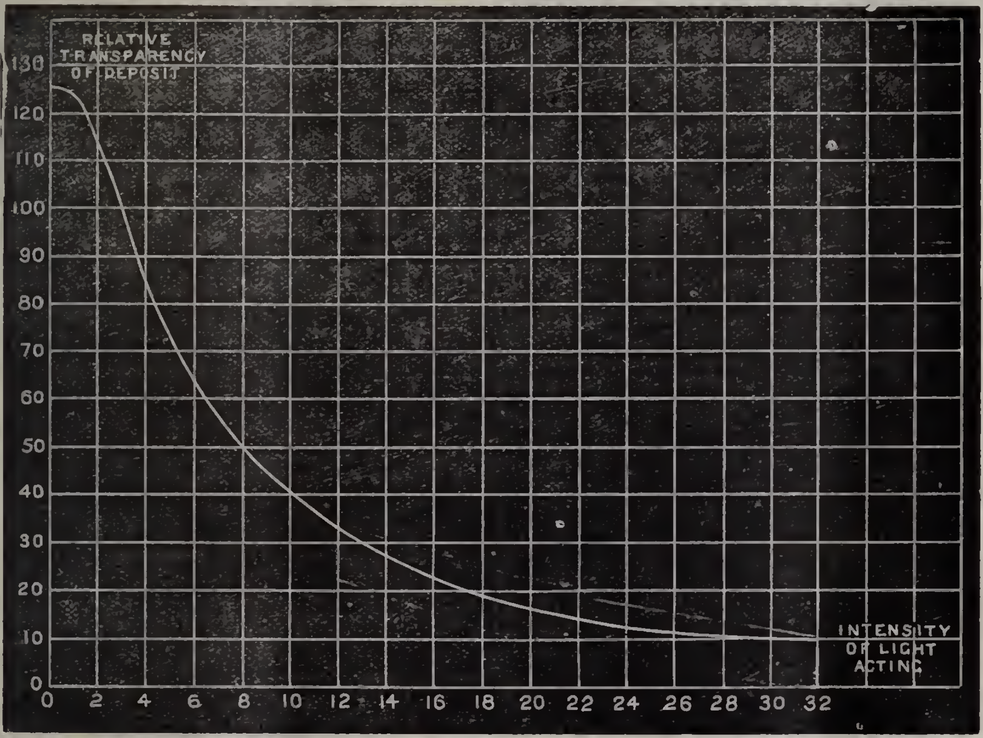
* In my Note-Book I find that in the 2nd set I say "Naked light very nearly 180°"; *i.e.*, nearly equal to the comparison light without rotating the sectors.

The film and glass $\frac{124\frac{1}{2}}{177}$ or ·7 of the light, nearly ;

and so on through the whole scale.

Now in Spurge's sensitometer every third number allows double the light to enter, if we commence at the small openings, and the two intermediate numbers are $2\frac{1}{3}$, $2\frac{2}{3}$. Thus square No. 9 was exposed to half as much light as square No. 6, and No. 6 to half as much light as No. 3.

The diagram I give will show the results of the above table.



To make matters plainer I have inserted a figure showing the ratio of density to intensity of light, and this, with the other figure, will give sufficient positive information to be of practical use.

Now the next point to which I wish to draw attention is the photographic value of such density, for it by no means follows that the optical and photographic values must be the same. In this particular case I tested the squares by means of platinum paper exposed to the daylight, through the developed screen of which we now know the optical value; and also exposed a piece of the same paper in Spurge's sensitometer, and developed them. I now give the value of the densities as shown by a comparison of the depth of blackness of the different squares of the negative with that of the print taken on the sensitometer. For my ordinary work I use a graduated shade of black to white, with which Spurge's sensitometer print has been compared:—

Developed negative print.		Sensitometer print.	Ratio of light acting on latter.
No. 15 square ...	...	equal to No. 2 ...	... ·078
„ 13 „ ...	...	„ „ 3 ...	.. ·098
„ 12 „ ...	...	„ „ 4 ...	... ·125
„ 11 „ ...	...	„ „ 5 ...	... ·157
„ 10 „ ...	...	„ „ 6 ...	... ·197
„ 9 „	(not quite)	„ „ 7 ...	... ·25
„ 8 „	„	„ „ 8 ...	... ·315
„ 7 „	„	„ „ 9 ...	... ·395
„ 6 „	„	„ „ 10 ...	... ·50
„ 5 „	„	„ „ 11 ...	... ·63
„ 4 „	„	„ „ $11\frac{1}{2}$ ...	... ·71
„ 3 „	„	„ „ 12 ...	... ·79
„ 2 „	„	„ „ 13 ...	... 1·00
„ 1 „	„	„ „ 13 ...	... a fraction

Of course this would not be such an accurate set of readings as the optical one. Taking No. 2 square (which by the optical method = 96), aud calling it 100.

	Photographic Value.		Optical Value.
No. 1 gives	105		104
„ 2 „	100		96
„ 3 „	79		83
„ 4 „	71		$71\frac{1}{2}$
„ 5 „	63		$60\frac{1}{2}$
„ 6 „	50		$51\frac{1}{4}$
„ 7 „	39·5		$40\frac{1}{4}$
„ 8 „	31·5		$29\frac{3}{4}$
No. 9 gives	25	less some fraction	$21\frac{1}{2}$
„ 10 „	19·7	„	17
„ 11 „	15·7	„	12
„ 12 „	12·5	„	$10\frac{1}{2}$
„ 13 „	9·8	„	$7\frac{1}{2}$
„ 15 „	7·8	„	4

From this it will be seen that the optical and photographic values agree very well if we except the last five numbers ; but these are uncertain, oecause of the difficulty in comparing deep shades of black, and the difficulty of getting such blacks uniform by a process like the platinum process, and when nearly the whole of the platinum salt has to be reduced. I think this is interesting, as it shows that the optical and photographic values of the density obtained by ferrous-oxalate development is equal, or, at all events, practically equal.

A very excellent sensitometer may thus be arrived at by taking a uniformly coated plate and exposing adjacent portions of it through a square aperture to a feeble light, say of a 10-candle gas flame 10 feet off, commencing with 10 seconds' exposure, and going up next to $12\frac{1}{2}$, then to 16, next to 20, next to 25, next to 32, then to 40, and so on, doubling the exposure every third hole. The development should take place with ferrous-oxalate carefully neutralised, to which is added 2 or 3 drops per ounce of a four per cent. solution of potassium bromide. The development should be carried sufficiently far to render the most exposed square nearly opaque, and then it should be optically measured as described. For ordinary negatives the shadow test may be inapplicable, as the shadows of the rod are rather large ; but the method can be modified by the grease spot method. The grease spot may be the size of a pin's point, and it can very readily be determined where the lights are of equal intensity.

Another application of this method is to measure the intensity of spectra taken on different salts of silver. By using a slide which exposes a little bit of a plate at a time, a dozen spectra with varying exposures may be made on the same plate. Each of these spectra is optically measured by the modified plan which I shall now describe. Instead of moving the rotating sectors, they are placed in any desired fixed opening, and the negative is moved across the condenser till the two shadows are equal. A scale is attached to the bright field, and a mark on the negative indicates the next position of the negative when the shadows are equally illuminated.

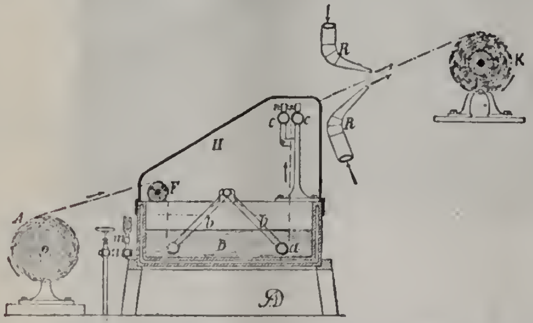
In this case a knitting needle is used as a rod to throw the shadows, and is sufficiently fine for the purpose in question.

The points of equal intensity of the differently exposed spectra are then marked, and from that the relative sensitiveness of each part of the spectrum is readily deduced. This optical method of measuring density is of extreme value in scientific work. As an example of its use, in the recent eclipse, when seven or eight photographs were taken of the corona at totality, the measurement of the relative lightness of each part of the corona is easily derived; and as one observer measured the caronal light at certain distances from the moon's limb in terms of a standard light by a method I introduced, it is very easy to refer any part of the corona back to any desired light, say that of the full moon.

APPARATUS FOR COATING PAPER, FABRICS, ETC.

The apparatus here described has been originally designed for the preparation of water-proof paper, but it may be employed also for many other purposes; for instance, the manufacture of antiseptic dressings, such as bichloride or other gauzes, also for making wax or paraffin paper, parchment paper, &c.

The paper or fabric to be impregnated is wound upon a reel, A, from which it is made to pass over the rollers, F, *a*, and *a*; the latter two of which are below the level of the liquid with which the paper or fabric is to be treated, and then it is made to pass between two rollers, *c*, *c*, where the excess of liquid is pressed out or wiped off. From there it passes between two blowers, R, R, which convey a blast of either cold or hot air, according to the nature of the material with which the fabric is charged. In the case of wax or paraffin, a current of cold air is required; in the case of fabrics impregnated with aqueous solutions, hot air will be necessary, and it may even be necessary to pass the fabric between heated rollers. Finally it is wound upon the reel, K. The reservoir B, containing the liquid, may be heated by steam if the nature of the material requires.—*Dingl. Polyt. Journ.* 1886, 464. Translated in the *American Druggist.*



Patent Intelligence.

Applications for Letters Patent.

2736. Henry Bolden, 17 and 18, Southampton Buildings, W.C., for "Improved means for attaching or detaching the tripods or supports of photographic cameras."—22nd February, 1887.

2737. Henry Bolden, 17 and 18, Southampton Buildings, for "Improvements in camera stands or supports, and in means for attaching cameras thereto."—22nd February, 1887.

2748. Max Otto Hund, trading as Sahl and Co., 33, Chancery Lane, London, for "Improvements in photographic camera stands."—(*E. Calix-Toussaint*, Switzerland.)—22nd February, 1887.

2803. William Dyke Wilkinson and Frederick Fowler, Stanley Works, 216, Bradford Street, Birmingham, Warwickshire, for "An improved back for photograph and mirror frames."—23rd February, 1887.

3028. Fritz Raschig, 6, Bream's Buildings, London, for "A process for the producton of hydroxylamin."—26th February, 1887.

Patent on which the Ninth Year's Renewal Fee of £10 has been Paid.

1097, of 1878. J. W. T. Cadett. "Pneumatic arrangements for use in photography."

Specification Published.

15,661. Alfred Julius Boult, 323, High Holborn, in the county of Middlesex, M.I.M.E., for "Improvements in photography, and in photographic apparatus."—30th November, 1886.

A detective camera with a rigid hinged double shutter, somewhat analogous to Vogel's curtain shutter, but inside the camera.

Official Abstract of Accepted Complete Specifications.

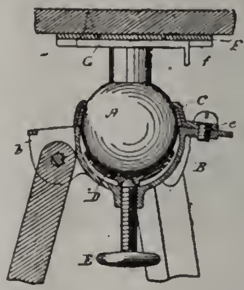
Swift, 12,250, 1886. "Shutters." For long or instantaneous exposure; two slides moving away from centre of lens, and one returning to close.

Groth (Collardon and Barthel), 5596, 1886. Grained negatives, taken from surface with grains of wheat, beans, or sand, &c., attached, or from surface roughened or containing design.

Groth (Collardon and Barthel), 5654, 1886. "Photos for preparing." Produced from ordinary negative against which is pressed uncoloured transfer paper made irregular by pressure against a plate or roller prepared in special manner.

Patents Granted in America.

357,299 Frederick E. Wright, Boston, Mass., "Tripod-joint."—Filed June 12th, 1886. (No model.)



Claim.—1. In a camera tripod-joint of the ball-and-socket character, the combination with the ball, the socket-plate, and retaining-ring of a compression-cup, and a screw for operating the said cup, to lock or unlock the joint.

2. In a camera tripod-joint the combination of a socket-plate B, compression-cup D, a retaining-ring, and an operating-screw.

3. In a camera tripod-joint the combination with the ball A of the socket-plate B, retaining-ring C, compression-cup D, and operating-screw E, threaded in the socket-plate.

VOGEL'S ISOCHROMATIC PATENT.

Some omissions having been made in reprinting the claiming clauses of this patent, we here give them in full. Readers interested should make a memorandum to this effect in our number of last week:—

1. The application and employment of the chemical combinations of silver or lead, with an eosine dye or cosine dyes, for producing highly sensitive isochromatic emulsion or gelatine plates, substantially as and for the purpose set forth in the foregoing specification.

2. The application and employment of dyes, known as optical sensitisers, in combination with the salts of silver, substantially as and for the purpose set forth in the foregoing specification.

3. The application and employment of various dyes, as mentioned in claims 1 and 2, in combination with soluble salts of silver, substantially as and for the purpose set forth in the foregoing specification.

4. The manufacture of combinations or solutions of dyes and silver, as strong optical sensitisers for colouring gelatine emul-

sions, or as bath for gelatine plates, substantially as and for the purpose set forth in the foregoing specification.

5. The application of silver salts not soluble in water, but in ammonia or acid, substantially as and for the purpose set forth in the foregoing specification.

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Correspondence.

THE DYNAMIC HYPOTHESIS OF THE LATENT IMAGE.

Sir,—In the Photographic News of February 25th last, Mr. R. W. Robinson states that Mr. Carey Lea first set forth the dynamic theory of the latent image.

This is an error. The dynamic hypothesis was first promulgated and fully elaborated by the late Mr. Mungo Ponton and myself. Afterwards Mr. Carey Lea considered it to be the best hypothesis to explain his valuable original experiments in relation to the latent image, and immediately I reminded him in the *British Journal of Photography* that he was not the first in the field with the hypothesis.

The nature of the latent image is the problem at the root of all photography, otherwise I should probably not have troubled you upon a personal subject.

W. H. Harrison.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—I find in Mr Debenham's letter in your last issue, four objections to the standard that I have proposed.

First.—He remarks, "The new standard now proposed does not appear to possess any advantage whatever, theoretical or practical, over the accepted one, whilst there is an obvious practical disadvantage, particularly to the photographer who wishes to correlate the lenses and stops that he possesses, in having to divide the focus by such an awkward fraction as the square root of ten, instead of by the simple ratio 4." This, it is needless to say, is entirely wrong, for in obtaining the standard numbers in the two systems, the relative rapidities are divided by 10 and 16 respectively, the *square* of the denominators of the fractions, expressing the ratios taken as the standard. This is the point I particularly claim as the great advantage of my standard, in that it is directly derived at a glance from the relative rapidities (and this Mr. Debenham himself acknowledges), for in the use of the convenient divisor ten, a convenient decimal notation is readily obtained.

Second.—Mr. Debenham states that another practical advantage of the Society's standard is, that its base or unity is very closely represented by the Petzval or portrait lens, having the relation ¼ of its aperture and focus, so that a good idea of the rapidity to which the Society's standard may be referred is very easily grasped. Again Mr. Debenham is in error, for the Petzval (or other forms of portrait lenses) ordinarily used in studio work, opticians at any rate, are well aware—and I can answer for thousands being made— have, working full aperture, without a diaphragm, a ratio of aperture to focus of $\frac{f}{3}$ approximately, which is much more nearly $\frac{f}{\sqrt{10}}$ (or $\frac{f}{3{\cdot}162}$ &c.) than the standard $\frac{f}{4}$, so that if any advantage accrues from this fact, it is in my favour.

Third.—Mr. Debenham states: "With a table prepared on the base of the accepted standard, the stops cut as recommended in relation thereto would bear the numbers 1, 2, 4, 8, &c., each requiring double the exposure of the next, whilst those cut to Mr. Dallmeyer's proposed standard would require an alarming array of decimals to represent them." Mr. Debenham has evidently only glanced casually at my table, otherwise he would find that in every case where convenient whole numbers in the P. S. standard come out, equally convenient numbers are given by my standard; and if particular instances are to be sought, it is evident that the system of apertures so chosen to produce these figures must give an exceedingly unwieldy column of "relative rapidities" to give with 16 as a divisor the convenient figures desired.

Fourth. Mr. Debenham claims that the standard unity $\frac{f}{4}$ has an advantage over the standard unity $\frac{f}{\sqrt{10}}$, in that the numbers marked upon the stops to indicate relative rapidity do not run so high in the former case. This is true, but so small and insignificant *in practical use* is this alleged disadvantage, that a glance at my table will at once dispel any doubt.

Mr. Debenham's letter I have thus proved to be very misleading in its attempt to aid "the photographer who has not made a study of optics," and though I should be sorry to include Mr. Debenham in that category, I have shown that he must at least have forgotten, while writing the letter referred to, the first principles of a subject published and spoken upon by him at some length.

Finally, on reference to a communication of Mr. Debenham, published in April, 1884, he states that the P.S. standard was adopted at *his* recommendation. The concluding sentence of his letter, therefore, explains itself. However, the Photographic Society of Great Britain will probably not stultify itself in any sense, but will, I trust, give due consideration to any effort put forward by its members to arrive at simpler and more advantageous results. Again, for the guidance of those who possess lenses by other opticians, as well as my own, I have appended in the table the figures of the P.S. standard. Mr. Warburton, in his table, only gives the P.S. numbers to two places of decimals, and, for ordinary guidance in exposure, this is doubtless sufficient.

Thos. R. Dallmeyer.

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Proceedings of Societies.

Camera Club.

The meeting on Thursday evening, 24th February, gathered to hear and discuss a paper sent by J. F. Mostyn Clarke, entitled "Art and Photography—Portraits." In the absence of the author the paper was read by W. A. Greene. D. P. Rogers occupied the chair.

Previous to the paper of the evening being read, W. K. Burton, by the desire of some of the members, brought up the following subject:—He said it was known that a most unwarrantable attack had been made in one of the photographic papers upon J. Traill Taylor in connection with the address he had delivered at the Camera Club Conference. Some indignation had been felt at the reflections cast upon Mr. Taylor personally, and in regard to the paper he had read. In consequence, a letter had been written and signed by such members of Committee as were available at the time. This was sent to the paper in question, but was refused insertion, and it was now considered desirable for several reasons that it should be read at one of these meetings of members.

Mr. Burton then read the letter, which ran as follows:—

Camera Club, 21, *Beaford Street*, *W.C.*, *Feb.* 15, 1887.

Sir,—We, the undersigned members of Committee of the Camera Club, request the insertion of this letter in your next issue to protest in the strongest terms against what we consider the unwarrantable attack made on Mr. J. Traill Taylor in the account of the proceedings of the Camera Club Conference contained in your last number. Mr. Taylor was specially asked by the Committee to read a paper at the conference, and, far from thinking that the Camera Club was "slighted" by the paper he did read, we consider that he brought before the meeting, in a thoroughly practical manner, matters of real importance to amateur photographers, the solution of the difficulty of enlarging with ordinary coal gas, and without expensive apparatus. There was nothing that could be likened to the manner of a manufacturer's representative in the way in which Mr. Taylor brought forward the subject.—We are, Sir, yours truly (signed) George Davison, W. K. Burton, W. H. Hyslop, A. R. Dresser, E. Ferrero, John B. Campbell, H. J. Gifford, W. Asbury Greene, J. France Collins, D. P. Rodgers.

The meeting having heard the letter, agreed in the advisability of including it in the reports of the proceedings.

On a call from the Chairman for objects of interest, Mr. Gifford exhibited a new three-fold stand, and

W. K. Burton showed some interesting examples of reversal of image sent to him by Mr. Lewis, of Hove, Brighton. By exposing an ordinary dry plate for a few seconds to diffused daylight under a negative, and then developing in the usual pyro developer, a negative nearly as good as the original was obtained.

Mr. Dresser stated that by long exposure he had produced, with a dry plate, a positive from a positive without development, but doubts were entertained as to the accuracy of this statement.

Mr. Rodgers showed three interesting photographs done by Mr. Blanchard from twenty to thirty years previously. One, a silver print, having shown signs of fading, had been treated with mercuric chloride, and had stood unchanged ever since. Another was mounted on card with a lithographic tint, the character of this surface being, perhaps, accountable for the perfect preservation of the photograph, which had undergone trying treatment and exposure to damp. The third was a carbon print also in a perfect state of preservation.

Mr. W. Asbury Greene then read the paper on "Portraiture," sent by Mr. Mostyn Clarke (see page 132), calling attention at commencing to the following additional introductory remarks sent by the author:—

"I am very conscious, in attacking and endeavouring to treat with brevity and simplicity, so vast a subject as art—even in its relations to photography—how inadequate the work done must be; but my object is not to accomplish the work myself, so much as to enlist the thought and study of others. I allude to the introducing among photographers higher knowledge and standards in art than at present exist. Photography is the means—or *might* be the means—of making art possible in many a home where greater works, even in black and white, are now an impossibility. The existing state of things—perhaps I ought to say, as *I* see it—is anything but satisfactory. Why does one turn away in despair from the majority of photographic windows, and from a large proportion of the pictures in our exhibitions? Because of a violation of the laws, often the earliest and simplest, resulting from a want of true feeling in Art in some, and more frequently through imperfect study. The want of artistic excellence in pictures, it is fair to say, is often due largely to the nature of the papers upon which they are printed; for example, how much real feeling can be given to albumen prints—a most unsympathetic medium from an art point of view. Then platinotype, possessing most qualities wanting in albumen, is in the hands of all, save a few, sadly wanting in warmth of tone. Again, looking to the quarters where excellence is, we find it with men whose work is not given to the public, except in a very few instances; thus failing to touch the source of existing evil. To be personal: I have attempted to begin the alteration of this state of things in two ways—one, by the formulation of art elements; the other, by technical improvements in the printing of results. Of the former the paper to-night is a part, and I venture to hope that the work I have endeavoured to begin will be seriously continued by others, and will be taken up by some of those amongst us who are far more competent to complete the task than I myself am to commence it."

In discussion S. B. Webber thought a reflector was of great importance, but it was possible to have too much of a good thing. It was not pleasant, after using a looking glass or a reflector, to find a portrait of yourself and camera included in the particular picture you were taking.

W. Tomlinson had read it suggested in some Art Journal that photographers would find success easier in groups than in single portraits, because some at least came out well, and were satisfied.

E. G. Spiers had taken his own portrait by setting the camera before he went to bed at night, so that he was being taken before he awoke. The feeling that the photographic eye was upon him prevented him sleeping, and at seven he rose, and put the cap on, exposing again later on. He expected to come out twins, but the photograph was not bad, only a little corpse like.

G. Davison criticised the examples sent by Mr. Clarke as to composition and expression, and asked Mr. Burton what were the difficulties in the way of obtaining plain non-albumenized sensitized papers.

W. K. Burton said the plain sensitized papers could not well be preserved, but must be used freshly made. They were also difficult of preparation. He thought the ammonio-nitrate process the only suitable one. He considered that Mostyn Clarke's paper was a very valuable one, and that his portrait examples showed much skill.

A. Deed suggested a special exhibition, no retouching to be permitted.

E. Ferrero believed portraiture not worth anything without retouching, because of defects such as freckles, &c., being intensified in photography.

Mr. Barclay had heard it affirmed that if the plate were exposed through the glass back, these defects were overcome.

J. J. Roberts had not been satisfied with his results at portraiture on orthochromatic plates by artificial light.

D. P. Rodgers thought albumenized papers suitable for portraiture, and the gloss a distinct advantage for small sizes. He would glaze these highly, treat them as gems, to get all the light possible into the details. Lighting was a very great point in portraiture, and he had found the best reflector to be a large white cardboard placed as near as possible to the sitter, without being in the field of vision of the lens. With a looking glass as reflector he had got a double set of shadows. Referring to Mr. Barclay's remarks he would observe that taking the portrait through the back of plate would give a reversed picture in the print. The two sides of the face were never alike, and the nose never in the middle of the face. He had been very well pleased with the behaviour of orthochromatic plates in taking portraits by gas light.

H. J. Gifford referred to the necessity of having the surroundings suitable to the subject, if it were intended that the portrait or figure study should also be a picture.

On March 10th Mr. Norman Macbeth, R.S.A., will deliver a lecture on "The Composition of the Pictorial," with lantern illustrations.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 24th ult., F. W. Cox in the chair.

J. Traill Taylor opened the adjourned discussion on J. Hubert's paper (page 123). He commenced by referring to non-distortion claimed for the Liesegang paper, but E. Foxlee and himself found a strip placed in water to expand three-eighths of an inch. To M. Gaudin was due the honour of introducing collodio-chloride by means of two solutions, but he (Gaudin) left photographers to compile their own formula on tables of equivalents. This occurred about 1861. In 1864 George Wharton Simpson brought out the process improved, and gave a working formula, but failed to recognise the earlier claim of Gaudin. To W. T. Bovey, then known as the "Photographer's Assistant," and W. H. Prestwich, were due the advantages gained by the introduction of citric acid and certain organifiers. Swan appeared to have rediscovered the value of citric acid soon afterwards. H. Cooper also recommended sulpho-cyanide toning for the prints. H. Baden Pritchard publicly directed attention to the value of the process for transparencies and the reproduction of negatives in a paper read before the London Photographic Society in 1870, page 605, vol. xiv. It seemed that all the chloride salts, whether freely soluble in alcohol, or sparingly so, have at different times been used, and the substitution of lithium chloride for that of sodium or ammonium, cobalt or zinc, could scarcely be considered a novelty, and the adoption of one organic acid for another was of little importance—tartaric and citric acids being similar in their action. Seeing that an organic silver compound would be present in the lights, he failed to see why collodion prints offered greater permanence than those of albumen, which were not so bad as some supposed. He knew of a show-case exposed in the Bowry, New York, where albumen prints had not been changed since 1881, and they were still presentable specimens. The collodio-chloride process was a very beautiful one, and had been largely used in this country, but for some reason it had fallen from favour.

The discussion was continued by A. L. Henderson, who showed two examples on opal made with emulsion purchased in 1865 from Mawson and Swan. At the time, he said, these were of a beautiful purple tone; being anxious to preserve the colour, they were sealed in Canada balsam, and for several years had been stored from the light. The colour of the image was now warm brown, and the purity of the lights much degraded. The popularity of the process was then spoken of by A. Cowan and others, and it was said by some that the carbon process offered all the advantages, was quite as easy to manipulate, and more permanent.

J. **Hubert** replied at length to the various speakers, reiterating much that has already appeared in his paper. The reason why his print curled in the toning bath, while those prepared by Dr. Liesegang did not, Dr. Liesegang had written to inform him, was due to the commercial paper being strained on a frame during coating.

A question was then read regarding the right of trade enlargers to exhibit specimens of work made from customers' negatives, and to execute orders at the same scale of charges to other than professional photographers. After discussing various aspects of the case, its further consideration was adjourned until the following week.

Birmingham Photographic Society.

The usual fortnightly meeting was held in the Technical School, Bride Street, on the 24th February, J. W. **Harrison**, F.G.S., Vice-President, in the chair. Messrs. Hoskins and Leeson were elected members. In answer to question,

Mr. **Pumphrey** said four-inch condensers were the best size to use for lantern work.

As to question "What is the exact position to place the diaphragm in the lens?"

E. C. **Middleton** said experience should decide.

B. **Karleese** recommended the perusal of Dallmeyer's book of lenses, which gave precise particulars on the subject.

R. P. **Taylor**, on behalf of the Lantern Committee, stated that the number of slides had been reduced to six, and as their respective merits ran so very close, the committee had resolved to appeal to the votes of the members present; accordingly they were shown on the screen as follows, each picture twice :—

No. 1. "Hoar Frost."—C. Pumphrey (on Pumphrey's plate).
No. 2. "Scene in Wales."—B. Karleese (on ditto).
No. 3. "Dovedale."—E. H. Jaques (on Fry's plate).
No. 4. "Forest in Norway."—A. Reily (on wet collodion).
No. 5. "Dovedale."—B. Karleese (on Pumphrey's plate).
No. 6. "Cows at the Ferry."—E. H. Jaques (on Fry's plate).

The result of the voting was eighteen votes out of forty members present for No. 6, which wins the prize.

The next business was the development trials, and plates each of Ilford ordinary and rapid were exposed in Warnerke's sensitometer, and developed by pyro and ammonia oxalate—Beach's and an American developer—by Messrs. Delicate, Nock, Pickering, and Middleton; the results as to speed of developing lying respectively Beach, pyro, American, oxalate. The rapidity of the plates shown by the numbers of the sensitometer—showing nearly as high on the ordinary plate as the rapid; in fact, one seeming as good as the other—on showing the plates in lantern, those developed by pyro and Beach were denser in tone, and oxalate and the American rather better balanced gradations.

After some discussion, and an exhibititon of a number of lantern slides brought by the members present, the meeting was concluded.

The next meeting is on the 18th of March, when the American slides lent by the Lantern Camera Club will be exhibited.

Liverpool Amateur Photographic Association.

The monthly meeting was held on February 24, **George H. Rutter** in the chair.

James Lahy was elected a member.

The **Secretary** read a letter from Miss Calder, Hon. Sec. of the Recreative Evening Classes Association, asking assistance in making a series of lantern slides from photographs or drawings illustrative of the reign of Queen Victoria, with special reference to the Jubilee year.

Mr. **Atkins** exhibited a print which eighteen months ago had been fixed in hypo in the usual way, and then merely rinsed in water and dried without any washing. The print was in apparently as good condition as it ever had been, showing no appearance of fading through leaving the hypo in.

George H. Rutter read a paper on "Odds-and-Ends." He referred first to the various makes of films. He next mentioned the desirability of being provided with several convenient pieces of minor apparatus on a tour, instancing a compass, view meter (of which he showed specimens of Harvey Barton's and one on the principle of a monocle opera glass, also a combined focusser and view meter), and bayonet joint fitting to the lens. He then gave an account of some experiments to ascertain the value or otherwise of various baths preparatory to development. He exposed Eastman paper films upon the Atkins's sensitometer which consists of gradually increasing thicknesses of tissue paper mounted on a large sheet of glass, so that it can be placed in a window; the small stop of the lens was used, and five seconds was the exposure. Four exposures were made as rapidly as possible, and then each plate was cut into two, making eight pieces, and were divided into two lots, one to be developed with ferrous oxalate, and the other with pyro. The first of each lot was dipped for one minute in a fifteen per cent. solution of common table salt, the second one minute in a half-per-cent. solution of hypo, the third in half an ounce of the American standard alkali solution in three ounces of water, and the fourth received no preparation. They were then developed for five minutes, fixed, and washed, and the results exhibited to the meeting. Mr. Rutter then referred to Herr Gaedicke's article in the *Photographische Mittheilungen* on a preliminary bath of very weak hypo. His conclusions were that the sensitiveness of the plates is not increased, but the time of development shortened, which result seems to be confirmed by Mr. Rutter's experiments.

W. A. **Watts** read "A Few Words on Orthochromatic Photography." He said he had met so far with very little success, due, firstly, to endeavouring to work without a yellow screen, and, later, to the want of keeping powers in the sample of commercial plates he was trying.

He next tried dipping some plates in a bath of eosine, and drying, and found that with the yellow screen the exposure was increased about twelve times; and although there was no very decided orthochromatic effect, the negative and print therefrom compared with those obtained with a plain plate seemed to have gained immensely in vigour and contrast. He next referred to the processes published by Messrs. Hyslop and Wellington for dipping in a bath containing erythrosine and silver, and expressed the fear lest these processes should be held to interfere with Messrs. Tailfer and Clayton's patent. He advised members desirous of experimenting to try Ives's chlorophyl process, of which he gave some particulars.

Bolton Photographic Society.

On Wednesday evening, the fifth annual soiree (being the seventh annual meeting) was held, when the attendance of members and their friends numbered about 400. The room was nicely arranged, and the walls were hung with framed and mounted photographs, taken by members of the Society.

Mr. **Bridson** delivered an address, expressing his pleasure at seeing such a numerous gathering. Though the Society in the last year or two had not increased in numbers, much progress had been made, and more artistic skill and taste displayed. He announced that his prizes (gold and silver medals) had been won as under:—No. 1 competition, photographs taken during this season—(1) E. N. Ashworth, Turton, "Norwegian cariole;" (2) C. K. Dalton, "Old school, Winwick." No. 2 competition, photographs taken at any out door meeting of the Society in the past season—(1) C K. Dalton, "Boat House, Worsley;" (2) Wm. Laithwaite, "Whalley Abbey." No 3 competition, transparencies—(1) Jabez Boothroyd; (2) W. Laithwaite.

Mr. **Abbatt**, the secretary, read the annual report, which regretted that the Council could not congratulate the members on an increase of the Society, but its finances were still satisfactory. During the summer months open meetings had been held, and the operations of the Society had been very successful.

Over a hundred views were then thrown upon canvas by means of oxy-hydrogen limelight, manipulated by J. H. Leach, while R. Mercer described the views. Messrs. Waterlow and Sons had an exhibit, which consisted of eleven framed specimens of Collotype printing, Woodbury printing, and photo-zinco engraving.

The Photographic Society of Philadelphia.

In response to a call for a special meeting, issued by the President, the Society assembled on the evening of January 19th, by invitation of L. J. Marcy, to examine and test the efficiency of his new "electric focus lamp" for the optical lantern.

The light was produced by the "arc" system. The negative electrode was held in a fixed place by pressure and a stop. The positive carbon was arranged to slant forward and downward from above in such a manner as to allow its points to fall a little behind the negative electrode, thus throwing the concavity of the light mostly to the front, and producing an almost perfectly even illumination of the screen, free from shadows of the carbon points. The slant of the carbon rod, kept it in circuit by its own weight on the plate through which it slides, and which also directs and steadies its descent. An adjustable spring balances the force of the differential magnets to suit the current used and the length of the arc desired. The base of the lamp, which also forms that of the lantern, is wide, so as to insure steadiness of the entire apparatus. The brilliancy was such that the room was well illuminated by the light leaking from the various openings in the lantern, and the novel effect was experienced of a lantern exhibition in a room sufficiently light to enable all ordinary objects to be clearly seen, and persons recognised with perfect facility.

A large number of slides brought by members were projected on the screen, many of the slides being extremely dense. Slides of this character, which the lime light had failed to penetrate properly, were fully brought out by the electric light, and those of ordinary density were reproduced with great brilliancy and perfection of detail. The tremulous, undulatory variations common to the arc light seemed to be entirely overcome by the apparatus, so that in steadiness, as well as brilliancy, the lime was excelled.

The ordinary meeting was held February 2nd, President Graff in the chair.

The paper for the evening was read by William Bell upon the preparation of gelatine bromide emulsion, coating the plates, and drying the same in connection with his newly designed drying-box and closet. He demonstrated the use of his cabinet, which consisted of a case covering a floor space of only 30 by 20 inches, and about 4 feet high. It is enclosed by tight-fitting doors; racks sufficient to hold 204 5 by 7 plates are arranged one upon the other, and hold the plates securely and apart in saw-teeth notches. A current of air for drying is brought in from outdoors by means of a wooden trough, which is attached to the bottom and back of the cabinet, rises through the layer of plates, and passes out again at the top through a chimney connected with the dark lantern, which stands upon one side of the top of the cabinet, a free circulation being maintained by the heated air from the lamp. Upon top and to the left of the cabinet stands a case about 18 inches square, in which is an ice chamber for cooling and setting the emulsion; the plates are laid upon a series of four glass shelves, each shelf being levelled by an ingenious arrangement from the outside. A plate, on being coated, is placed upon the upper shelf, others following; by the time the lower shelf is reached (some three or four minutes) those first inserted are well set and ready to be placed in the drying closet beneath; an iron tank for ice, in warm weather, is at the base of the closet; and to insure freedom from dust, the current of air may be required to pass through gauze saturated with glycerine.

Mr. Wood exhibited the handsome bronze medal awarded him by the Photographic Society of Great Britain at their late exhibition.

Mr. Carbutt called attention to the use of citrate of ammonia in the developer for transparencies; he thought it gave a rich tone, and kept the shadows clear. Mr. Carbutt alluded to a foggy deposit which at times appears upon old lantern slides between the film and glass cover; he suggested that it might be a fungoid growth upon the gelatine, and stated that it can be prevented or removed by flowing the plate with a collodion four grains of cotton to the ounce.

Mr. Rau stated that he had observed the same foggy appearance in wet slides, and upon separating the glasses found the deposit to be upon the cover, which was readily cleaned again.

S. Sartain announced that, by special arrangement made with the directors of the American Exhibition in London, pictures which may be sent by members to the New York Exhibition can, at its close, be forwarded to London, and yet be admitted, although two weeks after the advertised date of closing for admissions.

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Talk in the Studio.

Photographic Society of Great Britain.—The next ordinary meeting will be held on Tuesday next, at eight p.m., at the Gallery, 5a, Pall Mall East, when the discussion will be taken on the paper read by J. B. Spurge at the last meeting, and a paper will be read by H. P. Robinson on "Exhibiting and Exhibitions."

Filter with Greased Edge.—Certain substances have the disagreeable tendency to creep over the edge of the filter in which their solution has been poured. This may be entirely prevented, according to Gawalovski, by treating the edge or margin of the filter with paraffin, wax, or any fat free from inorganic matter (leaving no ash on combustion). Nothing will in this case creep over the edge of the filter, though the latter may have been (improperly) filled to near the margin.—*Zeitschr. f. Anal. Chem.*, 1887, 51, translated in *American Druggist.*

Photographic Club.—The subject for discussion on March 9th will be "Old Dry Plate Processes."

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To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

E. G. Hughes.—1. From Hopkin and Williams, operative chemists, Cross Street, Hatton Garden. The cost is about one shilling per ounce. 2. No; consequently you must prepare them a reasonable time before you want to use them. A coloured screen is required.

James Cole.—For the purposes of the formula referred to you may regard a gramme as being equal to fifteen grains, and a cubic centimetre as equal to one-fourth of a fluid drachm. The treatment referred to does not do away with the need of using the ordinary fixing bath.

S. D. McKellen.—We are pleased to hear that the note has been of service to you.

B. H. Abbott.—To hand; thank you.

J. W. Wright.—1. As the advertiser does not put his address, we conclude he wishes only to do business through the usual trade channels; and, as a matter of fact, we do not know his address.

Studio.—1. About six feet at each end. 2. With clear glass, and a fall not less than one in two.

Russell Steele.—We are under the impression that he uses a Steinheil antiplanat.

Chas F. Chadwick.—Probably not; but it will be easy to get one made to order.

Uranium.—For the same reason that others are held over.

Eboy.—We do not know of any London agent, but you can obtain it by post from E. Liesegang, of Dusseldorf.

B. C. Fox.—1. Glycerine is—to judge by our own experience—the more convenient material, as oil corrodes the metal. 2. It is principally a question of accuracy in fitting, and, if the work is bad, there will be constant trouble.

J. Baxter.—The print enclosed is a Woodburytype.

F. G. R.—Make it much stiffer, so that it is like a corn-flour pudding, and apply it with a sponge.

Brightonian.—We feel sure that the law is against you, and probably your wisest course will be to put up with the loss, and say no more about it.

Robert.—Next week, if possible.

J. R. Gotz.—One may suppose that the almost chemically-pure paper sold as Swedish filter paper would be the best; but it is expensive. We have used it and found it quite satisfactory.

A Subscriber.—As far as we know, it is not sold in this country; but we will endeavour to find you the address of some one with whom you can communicate.

C. J. F.—Probably traces of hypo from imperfectly-rinsed fingers, or splashes in working.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

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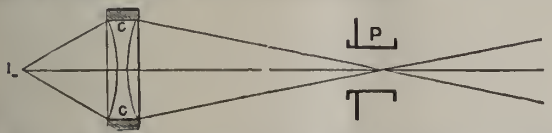
11.3.87

J. TRAILL TAYLOR ON A GAS LANTERN FOR ENLARGING.

The amateur, in most cases, wishes to make his enlargements by artificial light, he being ordinarily engaged at his usual work during the day; and the question as to what kind of a lantern it is best to use, is still an open one.

Optically, the lime light lantern is just sufficiently near perfection, if it be used intelligently, and if care be taken to so adjust the lenses that the image of the spot of light—we allude to the image formed by the condenser—is formed at the optical centre of the objective; a condition of things which can be practically realised by making all the elements of the optical system fixed and immovable, and focussing by altering the position of the negative from which the enlargement is to be made. The correct relative position of the objective, of the condenser, and of the light is indicated by the subjoined diagram.



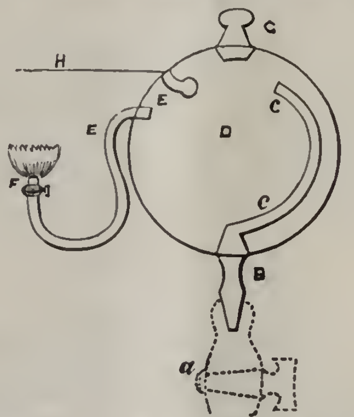
When the source of light is a small spot or a tolerably uniform circle, as in the case of the lime-light, the disc projected upon the screen is uniformly illuminated—provided that the above-mentioned optical conditions are fulfilled; but when, on the other hand, a flame is used, the illumination of the screen becomes unequal, a condition of things very noticeable in the various petroleum lanterns now before the public. For the exhibition of slides, this condition of things may be tolerated; but in making an enlargement it is very undesirable to commence work with an unevenly illuminated disc. A common, but very unsatisfactory, expedient is to place a sheet of ground glass immediately in front of the condenser.

Taylor, in a communication to the recent convention of the Camera Club, showed how one can obtain an evenly illuminated disc with a gas flame, and although his paper was printed in our issue of February 11th (p. 93), it is well worth while to call further attention to the matter, as it gives an easy and practical solution to a difficulty which amateur enlargers have long felt.

The ordinary flat gas flame, whether from a fish-tail or a bats-wing burner, is by no means so rich in the actinic rays as the flame of a paraffin lamp, but to meet this difficulty Taylor uses the flame of naphthalised gas, as produced by the so-called albo-carbon apparatus, an arrangement which can be had in most of the large gas-fitting warehouses for a few shillings.

The albo-carbon apparatus consists of a metal vessel in which is placed some of the solid hydrocarbon naphthalene, and the gas in its passage over this becomes charged with the hydrocarbon vapour, and an intensely bright flame is the result, but the best effect is not produced until the naphthalene melts.

In the diagram, *a* represents the cock which screws on the usual gas pipe, *c*, a curved pipe which leads the gas to the top of the vessel containing the naphthalene, E, the exit pipe leading the gas to the jet, and H, a metal plate which serves to conduct heat into the globular vessel. *C* is a screw plug, by the removal of which the vessel can be re-charged with naphthalene; this hydrocarbon being sold by the manufacturer of the apparatus under the name of albocarbon.

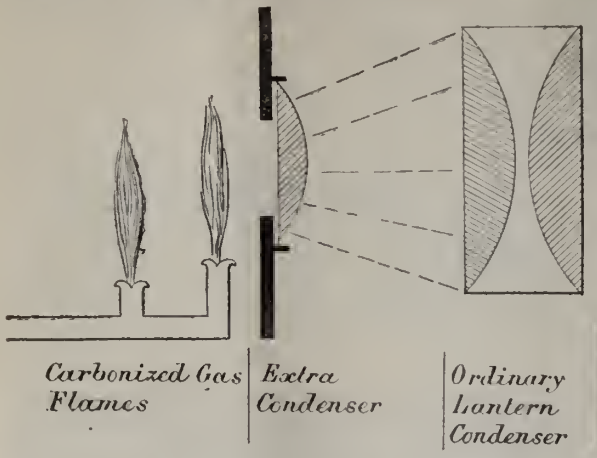


"A single flame," says Mr. Taylor, "even when enriched, is not sufficient, so I place one behind another—an inch between them. Indeed, it requires three to give the maximum effect, although two answer very well. In front of the foremost flame place a diaphragm, so as to use a disc of the best portion, and the smaller the disc, the sharper for enlarging at the expense of duration of exposure."

The essential part of the arrangement, as far as light and condensers are concerned, is shown by the diagram on the next page, and readers can refer to the paper on page 93 of our issue of Feb. 11 for further particulars.

When the condensing lenses are removed, and a sheet of letterpress matter is placed behind the backmost flame, one can guage the density of the flames by looking at the letterpress matter through the flames, the eye being guarded by a piece of cardboard perforated by a pin. The printed matter should, under these circumstances, be quite invisible through any part of the combined flames, and, in order to ensure this result, it is sometimes best not to have the several flames quite at the same height.

In devising this arrangement, Taylor has added to the resources of the amateur photographer ; and the professional—although many may think his work is over at sunset—may often find it advantageous to work with the arrangement here described.



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THE EXHIBITION OF PHOTOGRAPHS AT NOTTINGHAM.

This exhibition, which opened last month, may rank as a success both as regards to the quality of the exhibits, and the number of exhibitors.

Seven silver medals have been awarded by the judges (Jas. T. Hart, T. C. Hepworth, and A. W. Wells), and the following are the recipients of the award of 1st grade :—

T. A. Green, landscapes.
Leonard Blake, portraits.
Frank M. Sutcliffe.
Harry Tolley, rural scene.
William Adcock, for figure subjects.
H. Manfield, for architecture.
W. Clement Williams, for landscape.

As to bronze medals, six have been awarded. The successful exhibitors being :—

R. W. Robinson, landscapes.
James Lafayette, portraits.
H. P. Robinson, subject picture.
W. C. Williams, landscape.
P. H. Emerson, figure subject.
Edward Brightman, architecture.

Certificates were awarded in plenty, the following exhibitors being the names of those thus honoured :—R. B. Berry, H. N. King, W. W. Winter, F. Whaley, George Hadley, Bedford Lemere and Co., C. B. Wright, P. H. Emerson, H. B. Berkeley, E. W. Alabone, W. Willis, Florence Harvey Arthur Mashall, W. C. Williams, A. C. Bricknell, Alex. Keighley, H. Manfield.

◆

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.C.S,*

Senior Assistant Lecturer on Chemistry and Lecturer on Photography in the Yorkshire College, Leeds.

We have now to consider why certain dyes act as sensitizers for particular rays, and to what class of dyes we may look for other sensitizers with the greatest probability of finding what we want.

Many dyes which act as sensitizers produce anomalous dispersion—*i. e.*, when they are used as prisms, they produce a spectrum in which the colours are arranged in an order different from that observed in an ordinary prismatic spectrum. On the other hand, many of the best sensitizers do not show the phenomenon.

Again, many sensitizing dyes, and notably those of the eosine group, show the phenomenon which is known as fluorescence ; but other sensitizers—as, for example, rosaniline—are not fluorescent at all. It is, however, interesting to note that in some cases the colour of the fluorescence corresponds more or less closely with the colour of the rays to which the dye makes the plate sensitive.

Both anomalous dispersion and fluorescence depend on the power which certain substances possess of altering the wave-lengths of certain rays, and it does not seem unreasonable to suppose that this power, whatever may be the cause of it, may also play a considerable part in the sensitizing action of dyes, since a large majority of the sensitizers are either fluorescent or show anomalous dispersion. At present, however, it cannot be said that there is any very definite evidence of such a connection.

No definite relation can be traced between the sensitising action of a dye, and its chemical constitution. It is true that in many cases substances of analogous composition behave similarly. Fluorescein and benzyl-fluorescein both sensitise for green ; the chlorine, bromine, and iodine derivatives of fluorescein all sensitive for yellowish green or yellow ; but on the other hand, the nitro-fluoresceins exert very little sensitising effect. Then, again, phenolphthalein, orcin-phthalein, and their bromo or nitro-derivatives, have practically no sensitising properties, although they belong to precisely the same class of compounds as fluorescein, eosin, erythrosin, &c. Benzaldehyde green and its sulphonic acid both sensitise for orange and red ; rosaniline sensitises for orange and yellow, but its sulphonic acid does not sensitise at all, and yet the relation between the last two compounds is precisely the same as between the first two. Further, isomeric substances—that is, compounds of the same composition but with somewhat different chemical relationships, such as orange R. and acid orange—do not produce the same effect ;* and many other differences might be quoted.

In a word, no definite relation has yet been shown to exist between the chemical constitution and general physical properties of a dye, and its action on a photographic plate.

It is a well-established dynamical principle that in order that an undulation or wave may produce any effect on, or, as we say, do work on a body, the motion of the wave must be absorbed or taken up by the body ; and this law holds good for photographic as well as for any other kind of effect.

Dr. J. W. Draper, of New York, first showed that "the chemical action produced by the rays of light depends upon the absorption of those rays by sensitive bodies,"† and the question was afterwards worked out in greater detail by Vogel,‡ whose experiments included not only the ordinary silver compounds, but also mixtures of silver salts, with various dyes and other organic substances. This result has been amply confirmed by other investigators, and notably by Dr. Eder, and it may be taken as definitely established that in order that a given ray of light may exert any photographic or other effect on a substance the ray must be absorbed by that substance : that is to say, the wave as such is destroyed, and its motion is transferred to the molecules of the substance, which are thereby thrown into more energetic vibration, the result being either the development of heat, or the production of chemical changes. The first case, in which the motion of the wave is converted into heat, is conveniently distinguished by Eder as *photo-thermal extinction*, whilst the second case, in which the motion of the wave is used up in the production of chemical change, is distinguished as *photo-chemical extinction.* To these may be added a third case, *photo-electrical extinction,* in which the motion of the wave is transformed into that variety of energy which we call electricity.

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* Continued from page 117.

* *Eder, Monatsheft. f. Chemie* 7, 331-350. *J. Chem. Soc. Abstracts* 1886, page 958.

† *Philosophical Magazine, Vol.* 19, 1841, page 195.

‡ *Berichte der Deutschen Chemischen Gesellschaft, und Poggendorff Annalen*, 1873, 1874, 1875.

It has previously been explained that different rays have different wave lengths. which correspond with different periods of vibration. Whether a given substance will absorb a particular ray or not depends upon whether the vibrations of the molecules of that substance are in unison with the vibrations of the ray. If a note is sung near an open piano the vibrations are taken up by the string or strings which vibrate in the same period—that is, which produce the same note when they themselves are struck—and these strings are consequently thrown into vibration, and, as it were, give back the note. All the other strings which are not in unison with the note sounded—that is, have not the same period of vibration—remain unaffected. Again, a tuning fork at rest will take up the vibrations of another that has been struck, and will thus itself be thrown into vibration, provided that the two forks are tuned so that they have the same periods of vibration, but not otherwise. Further, the vapours of metals such as sodium are found to absorb exactly those rays which they themselves will emit if they are heated to a sufficiently high temperature, the reason being that the vibrations of the molecules of the metallic vapour are in unison with those of the particular ray or rays which it absorbs or emits according to circumstances. Finally, silver gelatino-bromide is affected by blue and violet rays (fig. 2), because it absorbs those rays, but is not affected by yellow, orange, or red rays, because it is transparent to these rays and does not absorb them.

In order, then, to ascertain whether a given dye is likely to act as a sensitiser, and, if so, for what particular rays it will sensitise, it is necessary to ascertain which rays are in unison with the vibration of the molecules of the substance, or in other words, which rays the substance will absorb. This is done by examining what is known as the *absorption spectrum* of the substance.

It has already been explained that the spectrum of sunlight is not perfectly continuous, but is crossed by a large number of dark lines, which are not found in the spectrum of the lime light, electric light, &c., and which indicate that certain rays originally radiated from the sun have been absorbed in their passage towards the earth. The solar spectrum is, in fact, an example of an absorption spectrum. Similarly, if white light from a lamp or some other convenient source of illumination is allowed to pass through a coloured liquid such as a solution of magenta or eosin, and the transmitted light is examined with a prism (most conveniently with a spectroscope), it is found that the spectrum is no longer continuous like that of the original white light, but is crossed by one or more dark bands of different widths and intensities, which are termed *absorption bands.* These dark spaces or bands indicate that certain of the rays composing the original beam of light have been absorbed in their passage through the liquid. The position of the absorption bands can readily be measured, and it is found that under any given set of conditions the absorption spectrum of a substance is characteristic of that particular substance, and enables us to distinguish it from anything else.

It is, however, absolutely essential to pay careful attention to the precise conditions under which the absorption spectrum is examined. The breadth and intensity of the absorption bands depends upon the intensity of the original light, and upon the concentration of the solution or the thickness of the layer through which the beam of light passes. Moreover, the spectrum of one and the same substance may vary in the most remarkable manner according to the conditions. The absorption spectrum of a substance in the solid state is almost always somewhat different from that of the same substance in solution, and its character will also vary with the nature of the solvent. For example, the absorption spectrum of an aqueous solution of Magdala red is different from that of an alcoholic solution of the same dye. Further, if the substance is mixed with some other denser and more refractive substance the spectrum will be altered, all the bands being displaced towards the red end of the spectrum, in accordance with what is known as Kundt's law.

It must be borne in mind that the dyes are to be used mixed with gelatine, and gelatine is never perfectly pure. It may contain compounds of aluminium, calcium, or magnesium, and these, as Vogel has recently pointed out*, may combine with the dyes to form lakes, which may have absorption spectra very different from those of the dyes alone. The only method of any practical value for the purpose we are considering is to mix some gelatine with the dye under examination, spread a film of it on glass or any other suitable transparent substance in the ordinary way, allow it to dry, and then examine the absorption spectrum of the solid dyed gelatine. If under these conditions the dye shows a well-marked, broad, and strong absorption band in the yellow, orange, or any other part of the spectrum, it is probable that the dye will act as a sensitiser for that part of the spectrum which it absorbs. If the absorption band is narrow or weak, the sensitising action will be very slight. The position of the absorption band as thus seen will not, however, absolutely coincide with the position of maximum sensitising effect. For example, the absorption band of gelatine dyed with cyanine is nearer the line D than is the highest point of the second part of curve 4, fig. 3, and the absorption band of gelatine dyed with eosin is somewhat nearer the line E than is the highest point of the second part of curve 5. The position of the maximum sensitising effect is, in fact, nearer to the red end of the spectrum than the absorption band of the dyed gelatine. This result is due to the fact that in a photographic plate the dye is not mixed with gelatine alone, but also with the dense particles of silver bromide, which displace the absorption band towards the red end of the spectrum in accordance with Kundt's law. If, however, the absorption spectrum of the dyed gelatino-bromide plate itself is examined, it is found the position of the absorption band of the dyed gelatino-bromide always coincides exactly with the position of maximum sensitising effect. The dyed silver gelatino-bromide absorbs and extinguishes those rays to which it has been made sensitive by the dye, and the energy which previously existed as wave motion is in some way or other used up in effecting the decomposition of the silver bromide.

Various hypotheses have been advanced as to the way in which the radiant energy absorbed by the dye effects the decomposition of the silver bromide. Abney has described experiments which show that when cyanin is exposed to light it is decomposed, and the products of the decomposition have the power of reducing silver bromide in contact with a developer. From this it would follow that the dyes themselves are decomposed by the action of light, the decomposition being effected by those rays which the dye absorbs, and the products of decomposition being in intimate contact with the silver bromide reduce the latter when treated with a developer. This view has been controverted by Vogel and by Eder. It is supported by the fact that the majority of the best sensitisers belong to the class of "fugitive" dyes, which are very little used by dyers on account of the readiness with which they alter when exposed to light. On the other hand some good sensitisers are tolerably stable, and cannot well be supposed to undergo decomposition in the short time during which exposure lasts. Abney has pointed out, however, that in a dyed plate the dye is mixed with a relatively very large quantity of silver bromide in such a way that the small quantity of dye is spread over a very large surface, and the decomposition of only a very few particles would furnish a nucleus sufficient to initiate the process of development.

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* *Annalen der Physik und Chemie,* 1886.

Eder considers that the rays of light act simultaneously on the dye and the silver bromide. When the rays are absorbed by the dye alone, they mainly undergo photo-thermal extinction, the energy of the waves being almost completely transformed into heat, which slightly raises the temperature of the dye. In most cases there is likewise a slight amount of chemical decomposition, since most sensitisers are more or less sensitive to light. When the rays are absorbed by the dyed silver bromide, part of the energy is transformed into heat, but a considerable proportion of the rays undergo photo-chemical extinction, and their energy is used up in producing chemical decomposition. It is found that all good sensitisers have the power of distinctly colouring the granules of silver bromide, and indeed it seems that this property is essential to the production of any well marked sensitising effect. This fact is readily observed by shaking up some precipitated and washed silver bromide with a solution of eosin or erythrosin. Moreover, it is almost impossible to remove the dye from the silver bromide even by very prolonged washing with water, and these facts indicate that the dye and the silver bromide unite to form a kind of molecular compound of the same nature as the compounds formed by dyes with ordinary mordants. This compound as a whole absorbs the light rays, and the motion of the waves is absorbed by and communicated to the molecules of the compound. The latter are thereby thrown into such energetic vibration that the force of chemical attraction is more or less completely overcome, and the silver bromide is either decomposed into silver sub-bromide and bromine, or is brought into that unstable condition in which it is readily reduced to the metallic state by the action of a developer.

(*To be continued.*)

Reviews.

HINTON'S BOOK OF PHOTOGRAPHIC LABELS. Arranged by the Rev. F. C. Lambert. Price one shilling. (*Hinton and Co.*, 38, *Bedford Street, Strand, London.*)

A USEFUL series of labels printed on gummed paper and separated by perforations. The more useful labels are in multiplicate, and considerable thought has evidently been exercised in making up the series. Perhaps, however, in issuing a fresh edition, the number of blank labels might with advantage be increased.

LA PHOTOGRAPHIE ASTRONOMIQUE A L'OBSERVATOIRE DE PARIS. Par Contre-Amiral E. Mouchez; extrait en partie de l'annuaire pour l'an 1887, publie par le Bureau des Longitudes. (Price not stated.) *Paris:* (*Gauthier-Villars, Quai des Grands Augustins*, 1887.)

IN this little work of 100 crown octavo pages we have not only a concise history of astronomical photography, but also a good account of the working methods of to-day. Daguerre in 1840 attempted to photograph the moon, but without any marked success, the definition being very unsatisfactory; but in the same year Draper laid the foundation of astronomical photography by obtaining a good photograph of the moon with an exposure of twenty minutes. Since then the workers in the field have been numerous and successful.

Perhaps the most valuable part of the work before us consists of the photographs accompanying it. That of a lunar region near the eratosthen crater is a marvel of perfection as regards detail and gradation of tint, while Saturn and Jupiter are shown in quite a new light—that is to say, a new light to the general reader—in the series of photographs now published. In the case of the photograph facing page 72, we have nine views of Jupiter taken on April 21, 1886, and if these were hung up in educational institutions instead of the compass-and-rule-drawn diagrams so often shown, a clear step towards popular education would be made. This series shows the rotation of the red spot, and also shows the bands of the planet not to be symmetrical.

The work before us is a production of the first importance, and should be in every photographic library.

THE A B C OF MODERN (DRY PLATE) PHOTOGRAPHY. 22nd edition of the A B C. Price one shilling. (*London*—no date of time—*The London Stereoscopic Company*, 110, 108, *Regent Street, W.*)

AN accompanying circular says:—"This is not so much a new edition as a new book," and indeed it may be regarded as being a new book. The directions for working are concise and clear; moreover, a tolerably wide range of subjects is treated of. It is fair to mention that the book is shoppy, or, to some extent, of the nature of an advertisement for the apparatus sold by the publishers.

AIDE MEMOIRE DE PHOTOGRAPHIE POUR 1887, par C. Fabre. Douzième Année. Price 1f. 75c. (*Paris: Gauthier-Villars*, 55, *Quai des Augustins.*)

WE are pleased to receive the current issue of this useful annual, and the present volume should be in the hands of every photographer who reads French.

INSTANTANEOUS PHOTOGRAPHY FOR AMATEURS. By C. W. Bath, 1887. (*Charles Seers*, 1, *Argyle Street.*)

A VERY readable essay on the subject, and mainly confined to those points special to instantaneous work.

FILM PHOTOGRAPHY.

BY H. MANFIELD.*

IF I may not be considered out of place in going over the same ground, I may describe the stripping film, as a film of *insoluble* gelatine emulsion attached to a sheet of paper (which serves as a temporary support) by a thick layer of soluble gelatine. In appearance it resembles the ordinary negative paper, and its treatment is the same as regards exposure and development—in fact, if the negative is considered not worth stripping, it can be squeegeed to glass and printed from in the regular way.

Presuming the emulsion coated paper to have been exposed in the roller slide (and this is the only way to work films properly), it is cut into the right lengths, and then developed. The Eastman Co., in their instructions, lay especial stress on the fact that soda developer must be used, as there is a risk of the pyrogallic acid, when mixed with ammonia, attacking the gelatine substratum and rendering it insoluble; although this may be right in theory, it is not so in practice, and I have always used ammonia-pyro development in preference, as giving negatives of printing colour.

The following is the formula:—

A. Sulpho-pyrogallol.
B. { Potassium bromide, 120 grains.
Ammonia ·880, 6 drachms.
Water (distilled), 6 drachms.

To develop—take water 2 oz., A. 20 minims, and B 2 minims, commencing with half the quantity of B.

After devolpment wash the negative well, and fix in tolerably clean hypo—this will, as a rule, do away with the necessity of using the acid and alum clearing solution later on. The negatives only require a few minutes' washing, and are ready for the first of the stripping manipulations—viz., squeegeeing to the collodionised glass. Take a clean glass plate ¼ inch larger all round than the negative, dust it over with French chalk, rub clean with a cloth, and then coat with plain collodion. I am informed that enamel collodion diluted with 2 oz. ether and 1 oz. alcohol to the pint is the correct thing, but I turned out an old bottle of autotype transfer collodion, which answers perfectly. Let your collodion *set well*, and wash the plate thoroughly until the greasy lines have disappeared, then put your negative face downwards into the dish, bring it out clinging to the collodionised plate, and squeegee in the usual way, of course putting a sheet of American cloth between the negative and the squeegee, and not using the latter too vigorously. Now lay the plate on a table, negative upwards, place two thicknesses of blotting-paper over it, and then put upon the top of it a board with almost 10 to 14 lbs. weight on it. Take negative No. 2, squeegee it to a collodion-coated plate as before, and place it on the top of No. 1 with two more sheets of blotting-paper, and so on until you have a pile of about a dozen negatives under the board. This is an operation that does not take long, as a dozen plates can be coated, and the negatives squeezed on within an hour, and by this time they are ready for the first stripping, which may take place any time within fifteen minutes to five hours (or more) after the squeegeeing.

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* Abstract of a paper read before the Bristol and West of England Amateur Photographic Association.

The stripping off the paper support is next proceeded with as follows:—Turn your pile of plates upside down, and place No. 1 in a poreclain dish, pour over it water at 100° to 120° Fah. (not hotter). In about two minutes the paper will blister up, and become loose at the edges; then you can lift it up bodily at one corner, and gently draw it off the negative film, which will remain firmly attached to the glass; then with a little more warm water wash off any of the gelatine substratum that may be still sticking to the film. With ordinary care failure is impossible; but it is well not to use water at too high a temperature, or to attempt the stripping too soon after squeegeeing, or failure may result in either case. Stripping from the collodionised plate contrasts wonderfully with the original method, which required great care and delicacy of manipulation, for you can go ahead now without the slightest risk of spoiling your negative. No pouring boiling water over the film or rubbing it with the finger (generally into a hole) to get off the paper which would stick in some obstinate place; and, what is equally important, no waiting for the negative to dry between the squeegeeing and the stripping, but you can develop, strip, intensify (if necessary), and attach the gelatine skin, all one after another without delay. As regards intensifying, you can judge of the density of the image so well in developing that it should be seldom necesary; but when it is required, silver or mercury intensification can be applied at this stage. Should clearing be thought desirable, acid and alum can be used, but *not previous to the stripping*, since alum in any form would probably render the gelatine substratum insoluble.

To squeegee the "skin" to the film.—This skin is composed of gelatine, to which is added glycerine to render it flexible, and must be cut in pieces rather smaller than the negative, as it expands considerably when wetted. It should be soaked in water containing a little glycerine (glycerine one ounce, water 20 to 25 ounces)), for if placed in water alone the glycerine in the skin dialyses out, and the film becomes horny on drying. If, on the other hand, too much glycerine is used, the film will take a long time to dry, and be difficult to strip from the glass. The solution is best used fresh for each lot of films, or difficulties will occur in the drying. After the skin is soaked until quite limp it is squeegeed on to the film—bright side outwards—taking care to avoid air bubbles; it is then set to dry, the time occupied in drying depending very much on the warmth of the room and the state of the atmosphere. As to the drying of the plates, this occupies about the same time as the ordinary gelatine negatives on glsas. I usually carry my films into the kitchen at night, and find them dry next morning. When perfectly dry the film should be coated with collodion, and in a short time can be cut round the edges with a sharp knife, and stripped without difficulty from the glass. The object of this last coating of collodion is to prevent the film being affected by damp, and in this respect these latter negatives are superior to those made by the old method, which were liable in time to become slightly spotty, or to get stained by contact with the sensitised paper in printing if the paper was not absotutely dry.

Owing to the recent improvements in the process it will be found: 1st—That the stripping off the paper support is now a most easy and certain operation, on account of the drying of the film after squeegeeing to the plate being dispensed with; and secondly—That the whole of the manipulations will occupy no more time than is required for the washing and drying of a gelatine negative.

Several films should be treated in succession; and of course a certain amount of method is necessary in working a process of this nature, but nothing beyond ordinary care is requisite to mrke it a success. Personally, I have found it in every way successful, and consider the negatives made by it will compare favourably with those made on glass, and be superior as regards halation—in fact, I look to film photography for a distinct advance in the future in both landscape and interior work.

For tourist work, some films are simply invaluable; and who has not felt the want of them when travelling abroad, with the difficulties of the Custom House, the bulky luggage, and the risk of breakage? But we shall change all this, and with our roll-holder and spools of "strippers," set off in future to the "Continong" with the happy assurance that we have no plates to be smashed by the railway officials, or to be opened at the Douane; and, added to this, shall have the satisfaction of knowing that at the end of a long day's toil we shall be freed from that most tiresome of occupations, the changing and numbering of one's plates.

THEORY OF DEVELOPMENT.

BY J. WILLIAMS.*

By development of a plate is understood the continuation and intensification of an action commenced by light. When a plate is exposed in a camera, the bromide and other salts of silver are so acted upon by light as to set up an incipient state of decomposition—that is, the light seems to weaken the affinity between the bromide and the silver (I have mentioned only bromide, but the same remarks apply also to the chloride and iodide), so that when the developer is poured on the plate, the separation of the two elements (silver and bromiue) in the parts which have been exposed to light is effected long before the rest of the plate. It must not be forgotten that the whole of the plate is similarly affected by the developer, whether it has been exposed to light or not, and that it is only the difference in time between the blackening of the exposed and unexposed parts that makes development at all a possibility. This is a point that many amateurs would do well to bear in mind.

By a developer we mean any chemical or chemicals which have the power to reduce silver salts. These are known to chemists as reducing agents, and they are so called because all developers or reducing agents have one great property in common. They have all a great affinity for oxygen, and it is this property which enables them to reduce silver salts, and this develops the picture. All the pyro developers in common use (for dry plates) may be considered on four legs, or to be composed of four principal parts, viz.:—

(1) The reducing agent; (2) The corrective; (3) The alkali; (4) The preservative, all rendered active by being dissolved in the diluent water. I have a few words to say about each of these parts, and will try to answer intelligently the following questions:—

1. What is the use of the reducing agent?
2. What is the use of the retarding or checking agent?
3. What is the use of alkali?
4. What is the use of the preservative?
5. What is the use of the diluent water?

1. The reducing agent has the power to separate the silver from the bromine, chlorine, and iodine, or whatever other element or elements it may be combined with. This it does by combining with the oxygen of the water contained in the developer, thus liberating hydrogen, which combines with the bromine, iodine, &c., and leaves metallic silver in the form of a black powder. This black powder is the high light of a picture. The substances generally used as developer are pyrogallic acid, hydroquinone, and oxalate of iron, although many other substances could be used. A very interesting experiment is to add a little of each substance to a solution of nitrate of silver in water, and observe the different effects.

2. The retarding or checking agent. For this purpose some bromide is used, generally the bromide of potash, ammonia, or soda. This acts by forming a loose compound with the silver salts, which is much less susceptible to the action of developing (or reducing) agents than the silver salts are alone. The bromides therefore protect the silver salts from the developer, and thus check the progress of development.

3. The alkali is a necessary constituent of all pyro developers. The alkalis used are usually ammonia, or the carbonates of potash and soda. I should think that the carbonate of ammonia, or the hydrates of potash or soda, would also serve for this purpose. If you try to develop a plate without adding ammonia, potash, or soda, you will find that it will be a failure. Suppose you put a solution of pyro made acid with citric or

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* Read before the Cardiff Amateur Photographic Society.

nitric acid on a plate, you will find that no action takes place—at least, not for a long time. If you now add a little ammonia, potash, or soda, you will find that the development commences at once, and the more ammonia, potash, or soda you add, the quicker the development will take place. Chemists express these facts by stating that pyrogallic is active in an alkaline medium. The ferrous oxalate developer is, however, different; if you add an alkali to that you will make a mess of it. That is active in an acid medium. You know that the ferrous oxalate developer is composed of proto-sulphate (ferrous sulphate) and oxalate of potash. Ferrous-sulphate alone might be used, but it is not nearly so energetic as the oxalate of iron, which is formed by double decomposition between the oxalate, potash and sulphate of iron. If you take two solutions of nitrate of silver, and add to one of them a solution of ferrous-sulphate, and to the other the usual ferrous-oxalate developer, you will see that the sulphate of iron takes longer to blacken the silver (that is, to precipitate the silver) than the ferrous-oxalate developer.

4. The preservative. All the developers are very unstable compounds, because they are so susceptible to oxydation. When they are dissolved in water, they require something to protect them. In the case of pyrogallic acid, citric or nitric acid is used. I have said before that pyro is most active in alkaline solution. The acid is therefore added to counteract the oxydising tendency.

The ferrous oxalate developer is usually protected by floating castor oil or refined paraffine oil on the surface of it, and drawing off the solution with a tap or syphon. Hypophosphorus acid, or hypophosphite of soda, may be added (about one or two drams to a pint), and will also keep the developer.

5. The water used. It is always the safest plan to use distilled water; but, as a matter of fact, I have never heard of failures through using good clean tap water.

Having endeavoured to answer the questions I set myself, I think it would be a great step in advance if photographers would try and mix their developers and select their chemicals in a more intelligent manner: not to follow the books so closely, but to ascertain why this, that, and the other chemicals are used, and in what manner they act, and to regulate their mixing accordingly. In fact, the thing to be arrived at is to see scientifically with one eye, and artistically with the other.

ON A METHOD OF ESTIMATING PHOTOGRAPHIC DEPOSITS, WITH REFERENCE TO THE PRINTING QUALITY OF NEGATIVES.

BY JAMES B. SPURGE. *

The want of a method of defining the effect produced upon a sensitive film by the combined action of the developer, and the exposure to light it has received, has long been felt. To effect this we must possess means of giving to the central parts of a film a series of exposures which shall bear a definite ratio to one another. The sensitometer I had the pleasure of introducing to your notice, in conjunction with Mr. Mucklow, in 1881, fulfils the condition required, and has also the following important advantages:—Firstly, a fixed range, since proportionate areas of the illuminated screen diffuse their light over the base of each chamber, so that the relative amounts of light are independent of any variation in the intensity of the illumination. Secondly, the results show any defect inherent in the film, such as granularity, &c., since there is no medium intervening between the light and the film under examination, which is always liable, when present, to introduce its structure, or other defect it may have, into the result, and mask the effect we wish to observe. Thirdly, the construction of the instrument ensures inappreciable deterioration through hard wear.

An extended experience of its behaviour has demonstrated the ratio of 1 : 1·2599 (4 : 5), or every third chamber receives double the amount of light, is constant within narrow limits, and is independent of the method adopted to illuminate the aperture plate, providing the light emanates from innumerable points situated at various distances and in all directions perpendicular to lines forming a continuation of the axes of the chambers. Several plans have been tried with platinotype and albumenised papers respectively.

The aperture plate was arranged horizontal, so as to receive light from various points in the sky, direct sunlight being screened off. By inverting the instrument over a sheet of white paper evenly illuminated from the sky, or by direct sunlight. By fixing in front of the apertures about 1 c/m away pieces of opal, ground or coloured glass sometimes superposed.

This last plan, when opalescent or diffusive media are present, enables light emanating from points near together to be employed, such as the direct light from a candle or the electric arc. Prints obtained by most of these respective variations are found to possess a very near approximation to a constant gradation in each case. On the other hand, with sensitive bromide of silver films, this has not been found to hold good. I propose to defer the consideration of this latter point till I have advanced somewhat with my subject.

To assist you to quickly comprehend the way I intend to treat the subject, suppose a gelatine bromide of silver film is exposed behind a negative to a source of light. Upon development and fixing we should obtain a deposit upon the film that would vary in magnitude inversely to the opacities of the negative. I prefer to view this result as caused by the light being controlled or reduced in actinic value after transmission, when compared with the amount incident upon the negative. An attempt was made in the first place to prove that the ratio of the transmitted to the incident light is constant for various degrees of opacity formed in differently coloured media, when measured with gas and bromide films or solar light and albumenised paper.

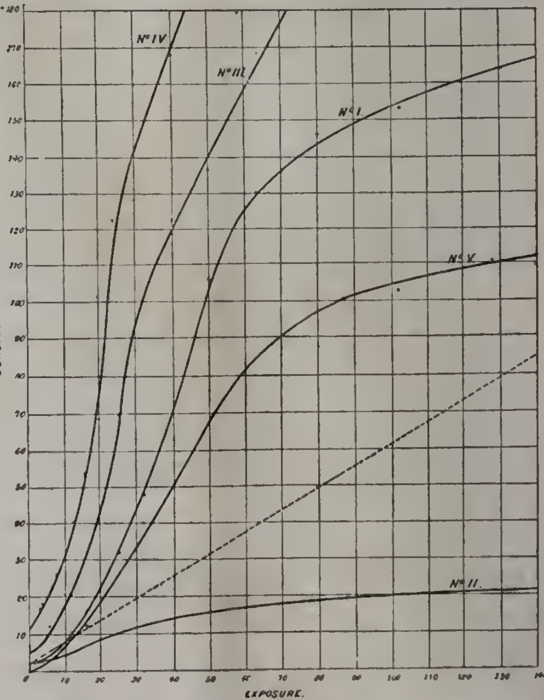
A supply of commercial bromide plates being obtained and marked F 1, F 2, &c., 7 were exposed in the sensitometer to the gas unit for three minutes.

F 1 to 5, was developed with normal pyrogallic.
F 6 " " " ferrous oxalate.
F 7 " " " weak pyrogallic.

After fixing and washing—

F 2 was stained with fluorescine in ammonia.
F 3 " " " rosine in hydrochloric acid.
F 4 " " " blue.
F 5 was bleached with mercuric chloride and restored with dilute ammonia.

To estimate the actinic opacity of any one of these deposits, a kind of stencil plate was made, consisting of sixty holes drilled in pairs, in such a way that when a sensitometer result is laid upon it, a pair of holes are devoted to each square, one for the purpose of permitting a portion of its tint to be seen, and the other to show its corresponding number. This was next arranged so that a sensitometer result could be secured upon one



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* Read before the Photographic Society of Great Britain.

side of it, whilst the other was made available for holding a gelatine plate. By employing F 1 to F 7 as sensitometers, by means of the above arrangement, and exposing similar plates for eight seconds respectively, a minimum of effect was produced for—

F 1 through No. 12 tint
F 2 „ „ 4 „
F 3 „ „ 12 „
*F 4 „ „ 10 ? „
F 5 „ „ 12 „
F 6 „ „ 8 „
*F 7 „ „ ?1 „

The next step was to determine their density, employing solar light and albumenised paper. Several series of prints have been obtained from them, some during brilliant and others in diffused sunshine, and some on days when the sun was obscured by clouds. The prints belonging to a particular series was exposed simultaneously, then fixed, washed, and dried.

The portions of the prints corresponding to the densities read by the gas and similar film experiments were cut out and have been mounted in a rectangular formation, so that the rows show the amounts of exposure, and the columns the variation in their opacities. It is a point of the greatest importance, as showing the value of the experiments, to observe how nearly the opacities agree together for a considerable variation in the exposure, which places us in a position to conclude that within these limits the opacity is constant for each case considered. With this knowledge acquired, we are able to define the chief characteristic of a photographic deposit formed on a film, as having a certain density or actinic opacity, which can be expressed as a ratio of the amount of light transmitted to the amount incident upon the deposit. Sensitiveness can also be defined as unity divided by the amount of exposure required to effect a given density.

These experiments were made in 1883. I have repeated them recently in a somewhat modified form, by removing the stencil mat from the sensitometer in order to give an increased area to each exposure.

In this series, after exposure,

Nos. I., III., and IV. were developed with ferrous-oxalate.
No. II. was developed with ferro-citro-oxalate.
After fixing and washing,
No. III. was stained red,
No. IV. was stained blue.

When dry the minimum of effect was observed to have been produced in chambers Nos. 23 and 25, 23 and 20 respectively. These were next exposed to gas used as sensitometers with similar films. Three series of numbers were obtained by giving once, twice, and four times; these will be found in Table I.

Table I.

Number of Experiment. 30.12.86.			Number of Plate used as a Sensitometer.	Number through which a minimum of effect was produced for an exposure of— 1,	2,	and 4 times.
1	5	9	I.	11	9?	8
2	6	10	II.	8	1 ?	?1
3	7	11	III.	14	12?	11
4	8	12	IV.	14	?11	8

Several series of prints were next obtained upon platinotype paper, by giving simultaneous exposures for each particular series, including one print direct from the sensitometer, the latter being exposed to the diffused light from the sky. These, after development and washing, were cut up and mounted upon strips of cardboard, to facilitate their comparison, which is now easily accomplished. Any two to be compared are placed parallel to each other, and moved along till equal tints are opposite, when a piece of blackened brass, having two holes coinciding with the centres of the tints, is placed over them for the purpose of screening the surrounding tints, so as to prevent any error that might arise through contrast. Examining the direct print seventeen gradations are to be found, No. 1 being the minimum, whilst No. 17 has acquired nearly the maximum, the remainder lying between.

Table II.

Sensitometer Print.	A. 30.12.86.				B. 30.12.86.				C. 30.12.86.				A. 31.12.86.				B. 31.12.86.				A. 21.1.87.			
	I.	II.	III.	IV.	I.	II.	III.	IV.	I.	II.	III.	IV.	I.	II.	III.	IV.	I.	II.	III.	IV.	I.	II.	III.	IV.
1	7	—	10	6	—	—	10	—	8	—	9	—	5	—	—	—	—	—	—	—	11	8	14	—
2	—	—	—	—	—	—	—	—	—	1	—	—	—	—	8	5	—	—	3	—	12	11	15	—
3	—	—	—	9	—	1	11	10	9	—	11	—	6	—	—	—	—	—	—	—	—	12	—	—
4	8	—	11	—	9	—	—	—	—	—	12	—	—	—	—	6	—	—	5	—	13	13	16	—
5	9	1	—	11	—	5	12	14	10	6	—	12	7	—	10	7	—	—	—	—	—	14	17	—
6	—	2	12	—	10	7	13	—	—	7	13	14	—	—	—	—	1	—	—	1	14	15	20	—
7	10	5	13	14	—	8	—	16	—	8	14	maximum.	8	—	—	8	3	—	6	2	15	16	21	—
8	—	7	—	—	11	—	14	maximum.	11	9	15		9	1	11	9	5	—	7	—	16	17	23	—
9	11	8	14	—	12	10	15		12	10	—		—	4	12	10	—	—	8	5	17	12	—	—
10	12	10	15	—	—	11	—		13	11	16		10	5	13	11	6	—	9	6	19	20	—	—
11	13	11	—	—	13	13	16		—	13	17		—	7	—	12	7	—	10	7	20	23	—	—
12	—	12	16	—	14	14	17		14	14	18		11	8	14	14	—	—	—	8	—	—	—	—
13	14	14	17	—	15	15	20		15	15	19		12	10	15	maximum.	8	—	11	—	—	—	—	—
14	15	15	18	—	—	16	21		—	—	21		—	11	—		9	1	—	—	—	—	—	—
15	—	16	20	—	16	17	22		16	—	—		13	12	16		—	3	12	10	—	—	—	—
16	16	17	maxi-mum.	—	17	19	—		—	19	—		—	—	17		10	4	14	12	—	—	—	—
17	—	21		—	—	—	—		21	20	—		15	15	18		11	—	15	—	—	—	—	—
18	—	—		—	—	—	—		—	—	—		—	—	—		—	—	—	—	—	—	—	—

Assuming the maximum to be attained in eighteen gradations, which will be found a close approximation, this experiment shows that a ratio of exposure of fifty is sufficient to produce a complete series of gradations upon the paper. A negative, for instance, having a greater ratio in the density than fifty will of necessity fail to register all its gradations upon the paper, since before a minimum of effect is produced through the opacity next in density to the maximum those towards the minimum will be more or less over-exposed, their relative gradation suffering in consequence.

I venture to propose the use of the word *control* to express this *ratio* of the density or exposure as the case may be.

The next step was to compare the direct print with those taken from the foregoing experiments. Table No. II was formed by taking at random any one of the prints from the several series, and comparing equal tints with those on the direct print, and then placing their corresponding numbers in rows, the depth increasing down the columns. Those in distinctive figures accord with gas and similar films.

The sensitometer with a piece of similar paper was exposed simultaneously with Series A. 31.12.86. The effect produced in Chamber No. 7 was found to be equal to tint No. 8 on the print obtained from No. I.

(To be continued.)

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* On reading these effects, taking F 4 as an example, a mere ghost was seen for No. 11, it has been put as 10 queried to the right. If 11 had been seen a little more distinctly, I should have put the latter number queried in this instance to the left. I found this to be a convenient way of expressing an interval between any two points when the exact position forms a matter of conjecture.

Notes.

A comedy of errors has been enacted at the Photographic Society. The chapter of accidents which began at the annual meeting with the omission of the usual motion for the reception and adoption of the annual report was continued at the meeting on Tuesday. The President, previous to the reading of the minutes, made the best of the matter by stating that the annual report and balance sheet were open for discussion, but, by a strange oversight, forgot to call upon any member to introduce the subject in a regular way, namely, by a motion that the report and balance sheet be adopted. The consequence was that S. G. B. Wollaston started the discussion by moving an amendment which practically was an amendment to nothing, for no motion was before the chair. The President, however, failing to see this, accepted Mr. Wollaston's amendment as an original resolution, and asked for a seconder. No one responding, Sebastian Davis went through the singular form of moving the adoption of the report as an *amendment* to Mr. Wollaston's resolution, which, as we have said, was in itself really an amendment. The matter as it stood was fairly confusing, but it became worse when T. Samuels, speaking after Mr. Davis, was assumed to be seconding Mr. Davis's amendment, whereas he was speaking to Mr. Wollaston's resolution, which apparently, not being seconded, the President thought had fallen to the ground. Then came another dilemma, for it was discovered that Mr. Davis's amendment was in the same plight as Mr. Wollaston's resolution, no one having seconded it. Ultimately seconders were found for both, and then the discussion proceeded, but the confusion was renewed when the President came to put Mr. Davis's amendment to the vote, for everybody was conscious something was wrong, and yet did not exactly know why. The amendment was, however, carried, and we presume the report may be considered to be adopted; but even now it is a question whether its adoption was not informal, because if the first motion was informal, certainly the amendment to it was also informal.

The Royal Institute of British Architects will send out a collection of photographs to the Adelaide Jubilee Exhibition. These photographs must be taken from executed buildings, the works of British architects. Unless a wish is expressed to the contrary by the exhibitors, the collection will be exhibited before it is sent out, and the photographs, after the close of the Adelaide Jubilee Exhibition, will be offered as a gift to some Art Institution in Australia. We do not understand that these photographs are to be printed in some permanent process. If not, they should be, to make them acceptable to the Art Institution in question. The photographs are to be sent to the Institute on the 15th inst.

A country woman, a short time ago, entered the studio of a provincial photographer on market day, and asked how much he charged for taking portraits, and how long it would take him to photograph her, as she was rather in a hurry. "Oh!" replied the photographer, "my price is five shillings the dozen, and I do not think I shall be longer than ten minutes." "Ah! but I only want one likeness. That won't take you so long, will it?" The photographer found it rather difficult to explain to the good lady why it would take the same time.

A correspondent informs us that having occasion to visit a West End photographer on the morning of the 3rd inst.—the day of the first Drawing-Room of the season—he found the waiting-rooms, the studio itself, and, in fact, the whole of the available space, filled with young, and in most cases beautiful, girls, attired in all the finery which a novice at Court is expected to put on. They had come, in fact, to be photographed in their Drawing-Room dress, train and all, though how a novice's train can be photographed in its full extent is a photographic puzzle which our correspondent, being an amateur only, does not attempt to decide. Possibly, he suggests, it (the train) may be taken in a series of sectional views (like the photograph of Sydney Harbour at the Colinderies) which are subsequently framed together into an elongated whole. Be this as it may, this operation of being photographed before being presented at Court is now considered an imperative social duty, which photographers will of course do their best to encourage. It is, moreover, a precaution that it is well for the novice to take, for too often the photographic reproduction of her Drawing-Room toilet is really needed to remind her what it was like when she entered St. James's Palace, so dishevelled and frayed and torn does it frequently become when she again emerges from the crush of this most crowded of Court functions.

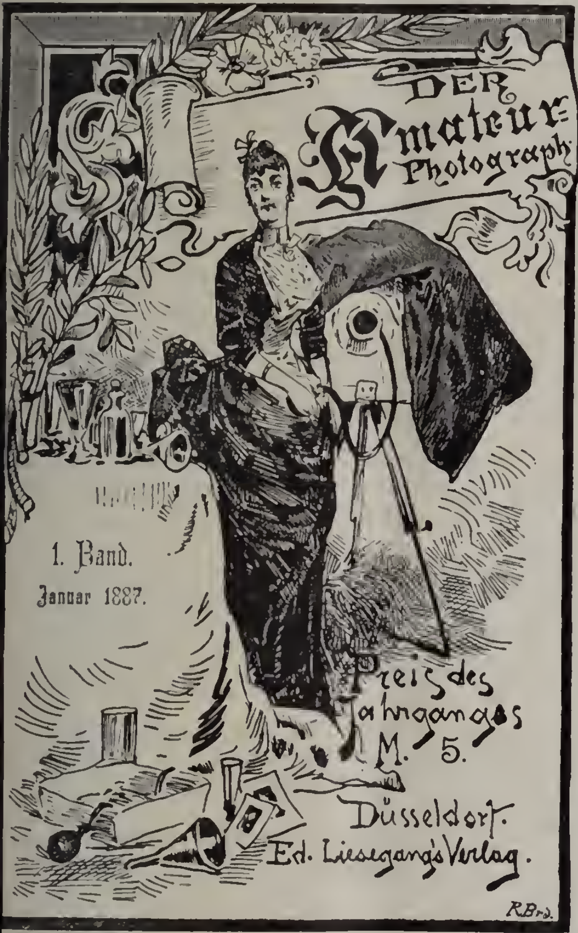
Where were the detective cameras on this occasion? Such a chance of photographing beauty is not often met with as that which presents itself in the Mall on the occasion of a "Drawing Room." The procession of carriages on Thursday was longer than usual. There were the "blocks" as of yore, lasting from a minute to ten minutes, or longer; aristocracy was cheek by jowl with the common people, and anybody who was so minded could have carried off scores of portraits of titled ladies, known or unknown. We do not advise the amateur to make the attempt on the next occasion, as, to take the portrait of a lady without asking her permission, savours of rudeness. Still, here undoubtedly is the opportunity.

A colossal picture, which is to be shortly exhibited in a gallery in Bond Street with the now not uncommon accessories of electric light and theatrical accessories, will demonstrate in a marked way how much artists may owe to photography. The painting in question represents the assassination of Gordon at Khartoum, and people who have been to that city have pronounced the scene, so far as commonplace details are concerned, to be most lifelike and exact.

Der Amateur-Photograph is a new monthly issued by Dr. Liesegang, of Dusseldorf, and it contains well-selected matter likely to be useful and interesting to the beginner; but the design on the title page is one calculated to create some surprise.

An exaggerated example of a woman of the current milliner-made and craftsman-constructed type, is drawn as operating on a burlesque camera—a woman so bebustled and farthingaled as to be a very characteristic feminine representative of that low type of male humanity ordinarily known as a "gent."

The full absurdity of such a design becomes apparent to the general observer when changing fashions have removed the prototype from everyday life, and the figure stands isolated in all its artificial ugliness.



Some months ago we drew attention to Stoddard's experiments in composite portraiture. He describes his results in the current number of the *Century*, and gives portraits of a face composed of seven members of a ladies' class in one of the American colleges, of one made up from a class of thirteen, of one in which forty-nine faces are united, and also one where the whole sixty-nine are blended. Similar portraits are given of members of the American National Academy of Sciences, and of the Monday Evening Club of Northampton, Massachusetts. Stoddard's paper forms the subject of an eulogistic article in the *St. James's Gazette*, which, apparently, is unaware that Galton has patiently laboured in "composite portraiture," although it gives him the credit of starting the "idea." Anyone, however, who did not know of Galton's extensive series, would certainly be misled by the writer of the article in question.

The *Globe* has raised the question of libel in portraiture not indeed with reference to the ordinary every-day portraits which are taken by painter or photographer, but with respect to the published portraits of public characters. The *Globe* remarks, "Within the last few days we have seen two pieces of portraiture purporting to represent a popular histrionic artist. They are not in the least like her; and yet in the minds of many they will be accepted as the woman herself, and if it is not hard, what is?" It is wrong, of course, but has not the *Globe* missed the point? If the presumed portrait makes the original better-looking than she really is, can it be said to libel her? The latter will probably not complain in such a case because the portrait is not like her. Of course if the artist has villified the lady, that is a different matter, but the *Globe* does not give any information in this particular instance.

By the way, we are not sure that photographers will be obliged to the *Globe* for the defence which it puts into their mouths. "A photographer is entitled," we are told, "more or less, to lay all the blame for a 'bad picture' on the sun, or at any rate there is a plausibility about this reference to solar deficiencies which cannot very well be set aside." We should much like to see the photographer who would advance such a plea. He might, it is true, admit that the bad light was the cause of the failure, but he would never malign the sun. Photography now-a-days, even with inferior artists, has reached a settled standard of manipulative excellence, and failures must be sought for on the part of the sitter rather than on the part of the photographer. An unsatisfactory expression is the cause of most "bad pictures," and this defect can rarely be said to be the fault of the photographer.

The Italian photographers must have been very early to work on the scene of the earthquake if the *Echo*, writing on the subject last week, spoke from actual observation when it said "the fact remains, as photographs will prove, that houses erected on rock foundations, and even those which were substantially built on alluvial foundations, received little if any damage." The *Echo* holds that the earthquake as an earthquake has been very much exaggerated, and possibly our contemporary is right, but its method of argument is rather eccentric. Of course if the condition of any particular house is in dispute, a photograph of the premises will settle the matter at once; but we fail to see how a photograph of a particular house which has remained undamaged will prove that other houses have not been damaged. To make the argument valuable, all the houses standing on rocks should have been photographed. We do not understand that this has been done.

The story of the "capture" of Ducret, who murdered Madame Chauvellier in Paris a week or two ago, is an exact parallel of the Currell episode so far as the police are concerned, and makes one doubt whether the boasted system of identification by photograph is, as at present conducted, of any use at all. Ducret having come to the end of his money, and unable to endure the pangs of hunger, entered a restaurant, and having enjoyed a good dinner, called the proprietor and told him he had no money. An altercation ensued, and as the shortest way out of the difficulty Ducret was kicked out of the place. By the side of the murderer while he was eating his dinner sat a policeman, who actually had Ducret's photograph in his pocket; but he took not the slightest notice. Even when the murderer, in despair of being captured, went and gave himself up, the inspector was very doubtful, although he had got a photograph by his side; and it was only after Ducret had answered a series of questions that the police consented to take him into custody. Either the English and French police must be very stupid, or the process employed to copy a photograph for distribution singularly defective.

Viscountess Harberton is very reluctant to make public her "divided skirt" with which she wishes to revolutionize female dress. Her meeting last week was for ladies only, and, so far as we know, the divided skirt is one of those things we very often read about, but very seldom see. Why is this? Do the Viscountess and her friends expect to govern fashion if they keep their new costume a secret? Why are not the advocates of the dual skirts photographed in the new costume, and the photographs scattered through the length and breadth of the land? Husbands and brothers, and other persons would like to pass their opinion on the innovation, and will be quite contented with photographs if they cannot see the originals.

PHOTOGRAPHIC LENSES.

BY J. TRAILL TAYLOR.*

Out of the orthoscopic lens were evolved others of different form which were free from the imperfection to which I have alluded, the most popular of these being the triple achromatic lens composed of three cemented compounds, the front and back being plano-convex or slightly meniscus in form, with an achromatic negative lens between them, by which the field was rendered flat.

The triple combination lends itself in an admirable manner to the production of what I may term a universal lens, by which I mean adaptability or adjustability of focus. Some years ago I constructed a lens of this class, in which a very wide slit was cut right through the mount in the position occupied by the concave lens. In this was fitted a sliding piece of brass pierced with four holes, in each of which was set an achromatised lens of a negative power. Notches on the slide ensured the lenses being quite central. The combination to which this system is attached is composed of two nearly plano-convex lenses, which when used alone do not give a flat field. By inserting the slide, the influence of either of the four concave lenses is to lengthen the focus and flatten the field. The foci I obtain by this slide are respectively seven, nine, twelve, and fifteen inches. When not in use, this slide packs away in a neat little pocket case, six inches long by one and a half inches wide, and half an inch deep. Of the advantage of being able to secure more or less subject on a plate, without having to unscrew or change the lenses, I need not speak.

Wide-angle, non-distorting objectives are a great power in the hands of a photographer who knows how to use them aright. Among the earliest of these was the American globe lens, so termed from the outer surfaces forming part of a globe or sphere. From the example now shown, it will be observed that each lens (the combination is symmetrical) is formed of a meniscus crown with the shorter radius from the optical centre, cemented in a concavo-convex flint. The construction of this lens favoured the formation of a flare spot, or ghost, in the centre of the picture, which would have disappeared had the maker departed from his globular idea, and brought the lenses a little closer together.

In 1864 Ross took the matter up and brought out a doublet free from the shortcomings of the globe. It was unsymmetrical in internal structure, being composed of a bi-convex and a bi-concave cemented front, and a concavo-convex and meniscus back combination. The lighter element, as you see, is to the outside of the front, and the denser element to the outside of the back. Soon after this, Zentmayer introduced a ratio lens, one in which the front and back elements were of dissimilar diameter and focus, the diaphragm being placed in the optical, not the mechanical centre. The objective was composed of two single or non-achromatised meniscus lenses of very deep curvature, and included a very wide angle. A feature by which it was distinguished consisted in a series of lenses of different foci, all screwing into one mount under such circumstances as to retain the diaphragm in the correct position for all of them. This was improved upon by Dallmeyer, who made a wide-angle rectilinear lens in which the lenses are each achromatised.

A wide-angle lens much used in America, made by Morrison, consists of a very deep achromatic front lens, and a single or non-achromatic crown meniscus as a back lens, of rather flatter form than the front. This, presumably owing to slight over-correction of the front, aided by the well known adaptability of the deep meniscus form, defines sharply over an extended field. There are other forms of wide-angle lenses, but I have spoken of most of those of a representative character.

We now come to a class of lenses so similar to each other in construction that one diagram will suffice to illustrate all. They are those to which the prefix "rapid" has been in many cases applied, in addition to a nomenclature so stupendous as would indicate the ransacking of almost every living and dead language to supply.

In 1866, Steinheil introduced a lens formed of two cemented combinations, adapted for covering a moderately large field, with an aperture of a seventh of its focus. Instead of forming it of flint and crown glass, which would not admit of such an aperture being employed, he used two kinds of flint glass, one possessing a higher index of refraction and dispersion than the other. From their wide aperture they were designated *aplanats*.

Numerous makers took the matter up, some by servile imitation, others by making departures more or less slight. This objective, which is more or less good according to the skill of the optician by whom it is made, is, for all-round work, one of the greatest possible value, for in a fairly good light it acts as a portrait and group lens; it is sufficiently rapid to enable the photographer to secure horses, even railway trains, in motion; it is orthoscopic, or rectilinear, hence can be employed for copying, and provided care in this respect has been bestowed upon its construction, it serves as a landscape lens, in giving no ghost or flare. But it is unfortunate that some makers, in their efforts to render it otherwise perfect, do not realise the importance of providing against the defect named. The lenses are separated so far as to hit a happy medium between flatness of field and astigmatism, and this is not unfrequently attended with flare. I have invariably found that this defect may be cured by bringing the lenses a little closer together in the mount. Even so little as the width of two threads of the screw has proved to dissipate the flare spot, which in many cases consists of an image of the diaphragm, which has a relation of conjugate focus to the back lens when internal reflections form a factor in its production, although it is sometimes occasioned by reflections from the front lens. Some makers of this lens have departed from strict symmetry, and claim that a more satisfactory result is obtained by having the back lens a little shorter in focus than the front.

But to revert to Steinheil. He did not rest satisfied with the introduction of the lens just spoken of, but made another having less angular aperture and greater angular covering power. It is formed of material similar to the other; the lenses are very thick, and are set very close together. Owing to their small diameter, lenses constructed on this principle are singularly portable, considering their great covering power, and one of our leading optical firms in London has made a speciality of extremely portable lenses of construction akin to that projected on the screen, in which the mounts of all are of similar diameter, and fit into one flange.

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* Continued from page 77.

Morrison, of America, makes lenses for which properties analogous to those described are claimed. He employs ordinary optical flint and crown glass, and corrects by making his crown lenses plano-convex, united to bi-concave flints, the contact surfaces of which are but very slightly curved. One peculiarity of this form is that definition fulfilling the requirements of artists is obtained by lenses having shallow curves, and being made of ordinary flint and crown, they are less liable to discolouration by light or abrasion by friction than if composed of dense flint. The lens shown on the screen also serves to illustrate the configuration of the American leucoscope objective, which being made of large dimensions and long focus, is mainly intended for large direct heads. There are several other topics than those touched on which belong to photographic lenses. Among these are diffusion of focus, so called, or depth of definition, as produced by spherical aberration, and by the use of a diaphragm, astigmatism, conjugate foci, lenses for special purposes, such as projection, enlarging, detective and panoramic cameras; the shape and use of the diaphragm and its proper position, the nature and cure of distortion, single or unachromatised lenses: the testing of lenses for the various aberrations, and lastly their grinding, mounting, and treatment. But it would be impossible to get all these overtaken in one paper.

[The Discussion will appear in our next.]

Patent Intelligence.

Applications for Letters Patent.

3139. Alfred Julius Boult, 323, High Holborn, Middlesex, for "Improvements in photography and photographic reproduction."—(*Albert Sichel*, United States.)—Complete specification.—1st March, 1887.

3178. John Edward Thornton, 3, New Lorne Street, Moss Side, Manchester, for "An improved substitute for glass for photographic and other purposes, and apparatus in connection with the manufacture thereof."—2nd March, 1887.

3235. Curt Friedrich Franzel, 34, Southampton Buildings, London, W.C., for "Improvements in photograph and similar albums and frames."—Complete specification.—2nd March, 1887.

3449. Horace Day, The Elms, Tunbridge, Kent, for "An invention by which pictures, photographs, or frames containing works of art, or other materials for exhibition, can be hung to the wall by ordinary picture rods or nails."—7th March, 1887.

Patent on which the Fourth Year's Renewal Fee of £10 has been paid.

1380, of 1883. R. Brown and others. "Gelatine reliefs and printing surfaces, &c."

Patent on which the Fifth Year's Renewal Fee of £10 has been Paid.

1166, of 1882. J. J. Sachs. "Surfaces for printing, &c."

Official Abstract of Accepted Complete Specifications.

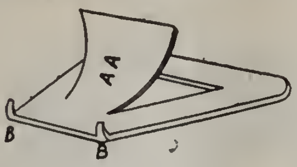
Groth (Collardon and Barthel), 5595, 1886. "Photo prepared and developed in special manner, and impressed into plastic mass."

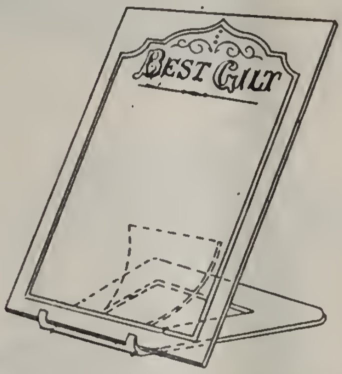
Specifications Published.

2876. Wyndham Harry Payne-Gallwey, Cremorne Works, Chelsea, in the County of Middlesex, Engineer, for "Improvements in portable photographic cameras, and apparatus relating thereto."—27th February, 1886.

This is a camera fitted with a drum to contain a reserve of plates.

Charles Potter, ticket publisher, printer, and manufacturer, partner in the firm of William Potter and Sons, Aldersgate Street, London, for "Stand for cards, photos, tickets, books, and any other articles, and for holding and displaying same."—Dated 25th January, 1886.

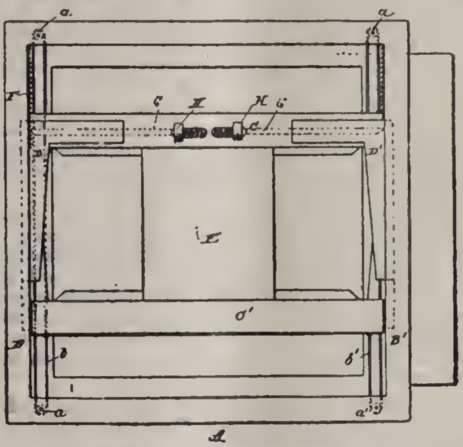




The accompanying diagrams show the nature of the stand; the flexible leaf A A being easily elevated to the extent required.

Patents Granted in America.

356,567. Erastus B. Barker, New York, N.Y., "Adjustable plate-holder for photographic cameras."—Filed September 15th, 1886. (No model.)



Claim.—1. In a plate-holder for cameras, the combination, with the movable plate-clamping bars, of endless belts connected with the ends of the bars, and arranged to ensure a similar and simultaneous movement of both bars in opposite directions.

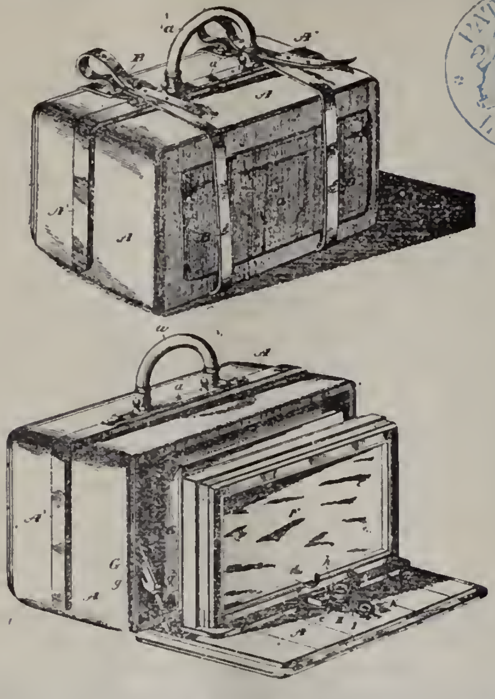
2. The combination with the frame A and bars C C', arranged to slide therein, of the pulleys *a a a' a'* and the endless belts *b b'*, extending around the pulleys and attached to the bars.

3. In an adjustable plate-holder, the combination with the movable plate-holding bar of a fastening-bolt and a holding device for receiving the end of the fastening-bolt.

4. The combination with the frame A and bars C C', of one or more ratchet-bars F, secured to the frame A, and one or more spring-actuated bolts G, carried by the bar C, and arranged to engage the ratchet bar or bars F.

5. As an improved article of manufacture, an adjustable plate-holder formed of the frame A, provided with the pulleys *a a a' a'*, the sliding bars C C', provided with the arms D, the endless belts *b b'*, secured to the sliding bars C C' and running around the pulleys *a a a' a'*, the ratchet bar F, secured to the side of the frame A, and the spring-actuated bolt G, carried by the bar C.

357,114. Daniel A. A. Buck, Cheshire, Conn., "Photographic camera."—Filed August 28, 1886. (No model.)



Claim.—1. As an improvement in portable photographic apparatus, a leather-covered camera-box having the external shape of a hand-satchel provided with a handle and straps, and having within one side a lens-holder, and having its opposite side formed by a hinged leather-covered door, in combination with a lens, a bellows, and means for holding a detachable focusing-glass or sensitized plate.

2. In combination with the camera-box, the hinged door or bellows-support, and the extensible bellows, a toothed rack which at its outer end is secured upon said door, and at its inner end is hinged to said box, and a pinion that is journaled within a lug which is hinged to the rear end of said bellows.

3. As an improvement in portable photographic apparatus, a camera-box having the external shape and appearance of a hand-satchel, and provided with a flap-covered lens-holder and a hinged rear side, a bellows contained within said box and adapted at its rear end to receive a focusing-glass or sensitized plate, means for locking in position and varying the inclination of said hinged side, and means for adjusting the rear end of said bellows toward or from said lens-holder, in combination with each other and with a lens.

357,483. Matthew P. Ismay, Newcastle-upon-Tyne, and Edwin Dodds, Low Fell, Gateshead, England, "Apparatus for coating photographic plates."—Filed August 30, 1886. (No model.) Patented in England July 9, 1886. No. 8,972.

Claim.—1. In an apparatus for the reception and support of glass or other plates while being coated with gelatine emulsion or other fluid, means for supporting the plates, having projections upon which the plates impinge, and troughs or grooves containing a cleaning-liquid in conjunction with said supports.

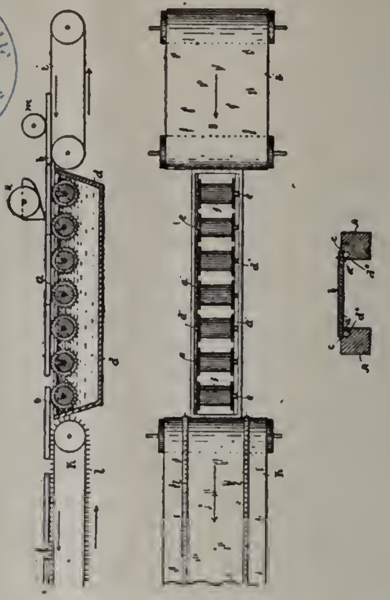
2. In apparatus for the reception of glass or other plates while being coated with gelatine emulsion or other coating-fluid, wheels upon the flanges or rims of which the plates are supported, and over or upon which they are caused to travel.

3. In an apparatus for coating glass or other plates with gelatine emulsion or other fluid, the combination, with wheels over the flanges or rims of which the plates are caused to travel, of a trough or troughs containing liquid, in which trough or troughs said wheels are mounted.

4. In apparatus for coating glass plates with gelatine emulsion or other fluid, wheels upon which the plates are supported and over or upon which they are caused to travel, having suitable means by which said wheels are cushioned, so as to maintain the wheels in contact with the plates.

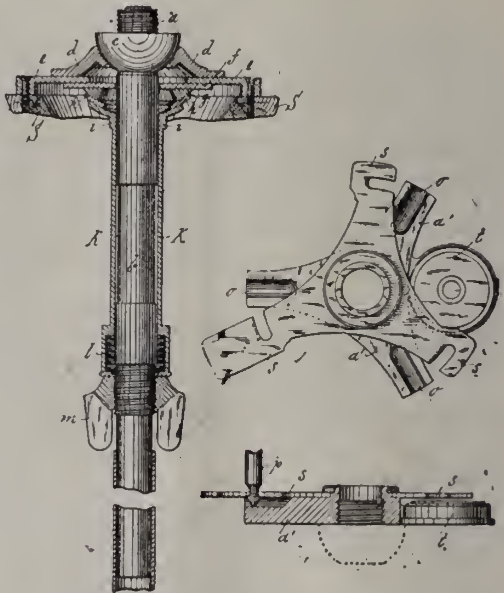
5. The receiving-table or endless band *k*, provided with teeth or points *l*, on to which the coated plates pass from the wheels.

PATENT OFFICE LIBRARY



6. The combination of the wheels, feeding-band *i*, and rollers *m*.

356,891. Friedrich Reinecke, Berlin, Germany. "Tripod."—Filed October 5th, 1886. (No model.) Patented in Germany January 8th, 1886, No. 36,577.



Claim.—1. The combination of the tripod-head S, the apertured guide-plate *e* fixed thereon, the socket *d* mounted thereon, the ring *g* mounted on the opposite side of said plate *e*, the ball or head *c*, the adjusting lever *b* secured to said ball, the embracing-tube *k* provided with a socket *i*, the spring *l*, and the nut *m*, all arranged.

2. The combination with the tripod-head S, and its plate *e*, of the sliding socket *d*, the hemispherical head or ball *c*, mounted in said socket with its plane face uppermost, and provided with a screw *a* on said face to receive the instrument, the adjusting-lever *b* secured rigidly to aud pendant from said ball, and means for holding said ball or head *c* down into its socket with a yielding or spring pressure.

3. The combination of the ball and socket *c d*, adjusting lever

b attached to the ball or head *c*, the tube *x*, and the rod *y*, all arranged.

4. The combination of the screw-pivot *a*, the adjusting-lever *b*, the ball and socket *c d*, the guide plate *e*, the rings *f*, *g*, and *h*, the tube *k* provided with a socket *i*, the spring *l*, the nut *m*, and the tripod-head S.

◆

HOW TO DEAL WITH PHOTOGRAPHS THAT ARE NOT CALLED FOR.

BY E. A. BONINE.

Once upon a time I looked into a photographer's garret, and there saw at least half a bushel of uncalled-for photographs. There were babes and children, young men and their girls, old men and women. How many hard and weary hours of posing, developing, printing, toning, and mounting, a photographer alone can tell.

These pictures tell me that that photographer was too good of heart, so he let the vulgar crowd—and here they were stowed away in a box—take advantage of him, and I propose to tell the craft how I have kept even with such people.

In the first place, I required part payment when the negative was taken, but sometimes it happened that they would be in in half an hour, or they had no small change, or something or other would happen. Well, all photographers know that the photographs on which no deposit was paid are the ones about which trouble arises. Whenever I had pictures uncalled-for in a reasonable time I put them in my show-cases, turning them *upside down.* Upon being displayed thus people would say, "*Well! well! what's the matter with him? Deadhead,* I guess.*" And one would say, "His pictures are not called for yet." It almost always had the desired effect, and they either called or sent for their pictures.—*Anthony Photographic Bulletin.*

◆

Correspondence.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—If Mr. Dallmeyer, in replying to my remarks on his proposed alteration of the standard for rapidity in lenses, had confined himself to arguments in favour of his proposal, supposing that any could have been produced, I might not have felt called upon to add anything to my previous letter; but as he makes several incorrect statements which might induce those who have not the time or the taste for examining the question mathematically to form a sort of outside opinion unfavourable to the Photographic Society's standard, it is desirable to set out facts in opposition to these statements.

Firstly. Quoting my remarks that "The new standard now proposed does not appear to possess any advantage whatever, theoretical or practical, over the accepted one, whilst there is an obvious practical disadvantage, particularly to the photographer who wishes to correlate the lenses and stops that he possesses, in having to divide the focus by such an awkward fraction as the square root of ten instead of by the simple ratio 4." Mr. Dallmeyer adds, "This, it is needless to say, is entirely wrong." It is not only "needless," but would be a bold defiance of the facts, to say that my proposition is "wrong," either "entirely" or otherwise. When several lenses have to be compared, and the stops standardised for rapidity, the first thing is to find the equivalent focus, and then to divide these foci by the number which will give the aperture representing unity, according to the standard in use. Suppose that three lenses respectively of 6½, 11½, and 17⅝ inches focus are in question. By the established standard, these measurements must be divided by 4, and this is very easily done either arithmetically, by the use of a foot-rule, by setting out a straight line and dividing it with compasses, or by simply cutting a strip of paper of the length of the focus and folding it twice. To obtain the diameter of the aperture representing unity on Dallmeyer's proposed standard the measure representing the length of focus must be divided by 3·162, &c., rather a troublesome operation, whilst the graphic and mechanical means do not lend themselves to this division as they do to the other.

The "relative rapidities" of which Mr. Dallmeyer speaks—relative exposures he means, doubtless, which are inverse to the rapidity—are just as evident at a glance on one system as the other; but the 1, 2, 4, 8, &c., of the accepted system, with the addition, if thought desirable, of intermediate numbers, 3, 6, &c., are more readily apprehended than the ·6, ·9, 1·2, or the 1·25, 1·875, 2·5, and other numbers which figure in Mr. Dallmeyer's table.

Secondly. Mr. Dallmeyer says that I am in error in stating that the Petzval* (portrait) lens is commonly made with an aperture of $\frac{f}{4}$ approximately, and that he can answer for thousands having been made with an approximately of $\frac{f}{3}$, not far removed from his proposed standard, and that therefore any advantage to be derived from the possessing of a lens corresponding with unity of the standard is in his favour. Mr. Dallmeyer does not venture to say that more lenses have been made with a ratio of $\frac{f}{3}$ than of $\frac{f}{4}$, and yet unless this were the case it is not easy to see where his advantage comes in. If thousands of lenses have been made with an aperture of about $\frac{f}{3}$, I suppose that no one will deny that tens of thousands have been issued whose largest opening is about $\frac{f}{4}$.

Thirdly. Mr. Dallmeyer writes as though there was no more convenient set of sizes for diaphragms for use with the established standard than those which give approximately simple numbers with his standard. It is in the nature of a standard that stops cut in relation to it may have a simple numeration, whilst those cut by another standard would, in relation to it, have a complex one.

Fourthly. That Mr. Dallmeyer should be sorry to include me in the category of photographers who had not made a study of optics, I can only regard as an impertinence; but when he says that I must at least have forgotten the first principles of the subject, he should have brought forward some proof or example of such forgetfulness; and this he has failed to do.

Finally. Mr. Dallmeyer says that I state in a communication of April, 1884 (at that time a lecture of mine on lenses was being published in your columns, and in those of the *British Journal of Photography*), that the P.S. standard was adopted at my recommendation—*Litera scripta manet.* I did not make the statement attributed to me by Mr. Dallmeyer; moreover, I was not a member of the committee of standards, nor even of the Photographic Society, at the time of its sittings.

W. E. Debenham.

THE DYNAMIC HYPOTHESIS OF THE LATENT IMAGE.

Dear Sir,—I am sorry to have done Mr. W. H. Harrison an injustice in attributing the dynamic theory of the latent image to Carey Lea, which he will readily believe was done quite unwittingly. From Mr. Harrison's letter it is evident that when Carey Lea published his experiments on the subject, it was necessary for Mr. Harrison to write stating his prior claim to the hypothesis. Not having come across his letter in my search into the literature of the latent image, I naturally fell into the mistake of attributing the theory to Carey Lea.—Yours, &c.,

Ralph W. Robinson.

EOSINE IN ISOCHROMATIC PLATES.

Dear Sir,—In reference to Dr. Vogel's specification and application for an English patent for the use of eosine compounds in isochromatic gelatine plates, perhaps you will kindly allow us space to inform your readers that the application has been opposed, and all proper steps taken to prevent the patent being granted, on the ground that it is a direct copy and infringement of Tailfer and Clayton's patent, dated January 8th, 1883, under which we hold the sole licence for Great Britain and the Colonies.—We are, dear sir, yours truly, B. J. Edwards & Co.

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* Deadhead in the American language means nearly the same as a bankrupt person.

* Under the head of Petzval or portrait lenses I have included all these in which rapidity is obtained by overcoming spherical aberration by the separation of the elements of the back combination; and all lenses of large aperture issued—at all events in quantity—previous to Voightlander's recently introduced portrait lens, have been dependent upon Petzval's invention.

The Grove, Hackney, London, March 7th.

Proceedings of Societies.

Photographic Society of Great Britain.

The ordinary meeting was held on the 8th inst., at the Gallery, Pall Mall, James Glaisher, F.R.S., in the chair.

Geoffray W. Millais, Mrs. Mary Pritchard, and Sir David Salomans were elected members of the Society.

The Chairman stated that previous to reading the minutes, the discussion of the Annual Report would be in order.

S. G. B. Wollaston moved that that portion of the Council report referring to the satisfactory hanging of pictures be omitted.

E. Clifton seconded.

T. Sebastian Davis moved that the report as printed be adopted, including the Treasurer's financial statement. He thought it very satisfactory, and unnecessary to alter it.

T. Samuels thanked the Chairman for the opportunity to criticise the Council report, especially as the Treasurer courted discussion on some topics which he mentioned. The Council in the report dealt largely with the late exhibition. Among other items it was stated that 675 frames of pictures were exhibited by 199 exhibitors. Upon counting the numbers in the official catalogue he found the statement to be inaccurate, as there was an omission of 115 exhibits that were placed on the table. He objected to this report being adopted as that of the Society for the year when no mention was made of one-sixth of the exhibits. There were several other points, but he had raised sufficient for a discussion.

The Chairman said that if a letter be addressed to the Council upon the subject it would be considered.

W. S. Bird remarked that as the report was now printed, could objections be put in the form of friendly criticism and suggestion for future guidance?

S. G. B. Wollaston considered it desirable that the report should be printed and in the hands of every member before the annual meeting takes place.

F. Cobb, in seconding Mr. Davis' proposition, thought they could not alter the report now printed.

Some doubt appearing as regarded the motion and amendment, W. H. Hyslop and Capt. Abney having also referred to it, the Chairman put it to the meeting, when Mr. Davis' motion was carried.

The Treasurer's suggestion to publish the Journal in two half yearly parts was then referred to by the Chairman, but failed to elicit any expression from those present.

F. Ince complained that opportunity was not afforded members to discuss their own affairs.

The Chairman said the annual meeting was set apart for the purpose. He could not entertain anything further.

F. Ince objected to this summary proceeding. All the members had seen the announcement that Captain Abney had retired from the position of Vice-President, an office only second to that of President, and he did think it due to the members of the Society that one of the Council should say why this has occurred.

The Chairman: Captain Abney has given his reason in the Photographic News, which arose out of the recent nominations. It was an exceedingly painful subject to him, and he hoped the resignation would be withdrawn.

Capt. Abney stated that the Chairman had correctly said it was the nominations, and his reasons had been pretty freely given in his letter to the Photographic News. He held certain fixed principles, and upon these he stood, whatever happened. The last election was unconstitutional, and he objected to serve on a council which had been elected in an unconstitutional manner.

S. G. B. Wollaston thought there was great irregularity in carrying out the rules, or the rules were inadequate; he therefore moved the elections be set aside as irregular.

The Chairman declined to receive the motion, but said the Council would consider and revise certain rules, of which due notice would be given.

Mr. Wollaston explained his opposition to the election by proving that his friend, E. M. Laws, had been proposed for Council without his permission.

The minutes of the previous meeting were then read, when Mr. Wollaston moved, and W. H. Hyslop seconded, that they be *not* confirmed.

This was put to the vote and lost.

The Chairman having asked J. B. Spurge if he was ready for a discussion on his paper read at the last meeting,

J. B. Spurge said he wished to add that he had constructed two revolving discs of cardboard, and these were tabulated in such a way that readings were readily ascertained.

There being no discussion whatever, the Chairman called for a vote of thanks to Mr. Spurge for the trouble he had taken, which was carried *nem. con.*

The Hon. Treasurer, W. S. Bird, read a paper sent by H. P. Robinson, entitled "Exhibiting and Exhibitions," in which the writer set forth certain views, of which the following is merely an abstract. Exhibitions in October are looked forward to by those in search of hints, and best efforts should only be sent. Pictures should be made specially for this event, and not a number picked out of the general work. The general quality was of a higher standard last year than five years ago. Sending too many pictures is a mistake; a small but choice selection being preferable. Harmonious effect easily spoiled by vulgar frames, creating eyesore to the visitor; many coloured card mounts, especially red flock surrounding large heads, noticeable last year. The Royal Academy only allows gold frames admitted for exhibition, and forbids white card mounts. If too expensive for photographs, then good German moulding and light oak might be chosen. Matts with large margin were bad, and wasted space. The backs of frames required care as well as the fronts, or damage would result. Hanging committees' duties became more difficult as processes increased. The work of known exhibitors should have preference to that of strangers, and the names of exhibitors and their work should be known to the hanging committee. In the discussion which followed,

W. E. Debenham thought exhibitors should choose only the best of their work for exhibition. He thought it rather bad taste to dub a certain frame vulgar because it did not please the eye of one individual; it was an unnecessary insult. In that room black frames made like those used by exhibitors were now shown, and cardboard mounts as well. If the card mounts could be used in the Water-Colour Society's room, and in the water-colour and other departments of the Royal Academy, why not by photographers? Why should the hanging committee show partiality to old exhibitors? That ought to be protested strongly against.

Capt. Abney said caps had been flying about, and one fitted him; he then related his first acquaintance with H. P. Robinson as a grumbler who had been solaced by a position on the hanging committee, and they had been good friends ever since.

T. S. Davis gave an interesting account of his experiences with different committees, and concluded by saying that nothing had ever made the progress of photography so popular among the public as the Society's Annual Exhibition.

W. S. Bird briefly replied to the speakers, and a vote of thanks having been passed,

The Chairman announced that the subject for discussion at the next Technical Meeting, on the 22nd inst., will be "Bromide Prints," and the next ordinary meeting will take place on Tuesday, April 19th.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 3rd inst., Alexander Mackie in the chair.

The desirability or otherwise for the Society to initiate enquiry into the methods of procedure and other working details regarding "Trade Arbitration Boards," with a view to introduce the system among photographers, formed the substance of a question which was discussed.

It was stated by W. H. Harrison that the idea of councils for the settlement of strictly professional matters worked well in Switzerland and other countries where the plan had been tried. It checked vexatious lawsuits and their consequences.

At the suggestion of J. J. Briginshaw, Hon. Sec., it was decided to bring the subject under notice at the forthcoming Convention. Cockling of mounted prints during drying then formed a topic of conversation. Various mountants were spoken of, and instances of staining photographs by the use of so-called waterproof mounts mentioned.

Preserving stock solutions of pyro ferrous oxalate, &c. (T. Morris's plan) by displacing the air of the containing vessel with common coal-gas, was referred to, and it was stated that a strong solution of pyrogallol so preserved had kept white more than a year. On the other hand, A. Cowan found that a dilute solution (4 grains) treated with gas discoloured in a few days.

The Chairman then spoke of the surfaces of different positive papers, with especial reference to the sizing of platinotype and bromide. In the discussion starch and arrowroot were said to possess advantages over any of the gelatine methods.

Cardiff Amateur Photographic Society.

At the recent monthly meeting of this Society, the President in the chair, Frederick Heitzman and C. G. Emery were elected ordinary members.

Mr. Jesse Williams gave an interesting lecture on the "Theory of Development" (see p. 149).

The President alluded to the importance of becoming *au fait* as to the action of photographic chemicals. He was afraid many of their members worked by mere matter of rote, and did not take the trouble to ascertain for themselves the "why and the wherefore." He urged them to give more attention to minor details; it was of great importance if they wished to become successful photographers.

The Hon. Secretary read a communication from John Stonie, the Curator of the Cardiff Museum, granting permission to the members to photograph anything of interest, and proffering his assistance.

Acting upon a suggestion made by the Honorary Secretary, the Committee of the Cardiff Free Library have added to their lending department a valuable collection of photographic works.

Bristol and West of England Amateur Photographic Association.

The usual monthly meeting was held at the Queen's Hotel, on 8th February, Colonel Playfair, Vice-President, in the chair, and there was a large attendance, a paper on "Film Photography" by Mr. Maufield having been previously announced.

E. Brightman was called on by the Chairman to read Mr Manfield's paper (see page 148), that gentleman being absent.

Rev. H. B. Hare inquired why the ammonia should attack the film. He considered that if a film was likely to frill at all, such was less likely with ammonia than with soda.

E. Brightman replied that it was the combined action of the ammonia and pyro which was referred to as toughening the film of gelatine too much. It was very noticeable how many were now writing and complaining of the frilling of plates, but doubtless they were in most cases using Beach's developer, a very potent producer of that trouble.

Rev. H. B. Hare had experimented with the "Beach" developer, but had not succeeded so well with ammonia.

The Chairman had not succeeded with the Beach developer anything like so well as with ammonia, his chief complaint being that it stained the film so much.

Rev. H. B. Hare considered that the chief objection to ammonia was its considerable and rapid reduction in strength.

S. Stevens advocated keeping it in a 10 per cent. solution, a very convenient mode for obviating this defect.

H. A. Hood Daniel said that he considered a 10 per cent. solution somewhat awkward, say in the case of a solution desired to be made of seven to one. He much preferred the mode of diluting ammonia, immediately on its receipt, with equal bulk of water, and so labelling it. Any strong solution desired could then be made.

Rev. H. B. Hare saw a good mode recommended for keeping the stoppers of bottles tight, namely, to place them upside down in a pan of water.

North London Photographic Society.

At the meeting held at Myddelton Hall, on March 1st, Traill Taylor, President, in the chair, W. Acland, W. Bedford, E. Dunmore, E. W. Foxlee, D. W. Hill, J. Martin, and G. W. Shadbolt were elected honorary members, and Harold Imray and H. H. Dimmock as ordinary members.

A question from the box was read, asking the best method of making oxygen.

The President described the ordinary method of making oxygen from chlorate of potash and manganese.

E. Conrad said that the addition of chloride of sodium had been recommended.

E. Clifton drew attention to the fact that oxygen was now being commercially produced by the Brins Oxygen Company, by the barium-oxide process, at a very cheap rate; oxygen so prepared did not contain chlorine, and therefore did not destroy the gas bags.

A question was then read, enquiring the cause of and remedy for collodion emulsion which gives crapy lines on coating the plate.

A. Mackie suggested that either the solvents used were not of sufficiently high specific gravity, or that the pellicle had not been sufficiently dried before redissolving. He added that with some samples of pyroxyline this fault was more likely to occur than with others.

In the adjourned discussion on Mr. Taylor's lecture, F. W. Cox asked whether the composition of the glass used in the manufacture of lenses influenced their rapidity, focal length and aperture being the same.

The President replied that, provided the glass was colourless there would be no difference.

Mr. Mackie said that, considering the importance of the lens, it was astonishing how ignorant photographers were of the simplest facts concerning its properties and use, and suggested that a few axioms applicable to lenses in general, whatever their construction might be, should be published in one of the photographic journals.

A large number of interesting slides was then shown by means of the optical lantern.

The next meeting will be held on March 15, when Edgar Clifton will deliver a lecture on "Cameras, Ancient and Modern." Visitors are invited.

North Surrey Photographic Society.

The usual fortnightly meeting was held at the "Greyhound" Hotel, Dulwich, on March 2nd, Mr. Wolff in the chair.

Mr. Walker gave a description of the Eastman stripping films, and an explanation of the method of working them. He also showed a series of reproduced negatives by A. Pringle.

The next meeting of the Society will be held on March 16th, when a communication on "Bromide Paper" will be made by A. Ryder.

Manchester Amateur Photographic Society.

The ordinary monthly meeting was held on Tuesday last, S. F. Flower in the chair. Thomas Carter, Leslie E. Clift, Geo. Wm. Cook, J. Guilford, Bernard S. Harlow, Arthur Holt, John Irvine, George Moseley, J. Partiugtou, A. Pickston, and John Weir were elected members.

A vote of thanks was accorded to Mr. Seed for "Marion's Practical Guide to Photography," and to T. Steventon for the presentation of a screen for the Society's lantern.

It was decided that the April meeting be a lantern meeting, and that the Society's own lantern be used.

W. Russell exhibited an improved changing bag, the novelty of which consisted of a window of stained parchment. This want he said was much felt, and was not supplied by makers.

T. Steventon gave a "Demonstration of Carbon Pigment Development," accompanied by a slight outline of the early history of this process.

After following the use of carbon or autotype printing up to the present stage, he proceeded to develop the prints.

Camera Club.

The subject arranged for the Thursday evening meeting of members on March 3rd was a demonstration of their carbon process by the Autotype Company. F. Machell Smith occupied the chair. Both Mr. Sawyer and Mr. Bird were present, and spared no pains to make the demonstration thorough and interesting. Every necessary appliance had been brought to the Club, and, in addition, a fine selection of autotype pictures was on view.

Mr. Sawyer introduced the subject by a lecture giving the history of autotype, and then proceeded, with the assistance of H. J. Burton, to the development of the exposed tissue on single transfer, temporary support, and on collodionised glass. Some very successful results were turned out, the rich colour and fine quality of the pictures obtained by the process proving very attractive.

After the demonstration J. E. Austin suggested that calcium-chloride tubes might be used with advantage to preserve sensitised carbon tissue. He did not quite understand how Mr. Sawyer proposed in some cases to obtain superior results by taking pictures through the glass side of the plate. He thought the frequent air-bubbles in the glass would spoil the negatives. He would like to know whether it were possible to get rid of the glazed surface from the carbon print after stripping.

W. H. Hyslop asked what effect gas fumes had upon the tissue.

V. C. Doubleday had attempted to make lantern slides in carbon, but had met with great difficulties, and had not been successful. He would like to know the simplest way of going to work.

G. Davison suggested pressing in contact with ground-glass to give a matt surface to the stripped carbon print.

Machell Smith thought grained zinc would be preferable.

J. R. Sawyer said they had been experimenting in regard to gaining a matt surface. The processes named would no doubt secure the end in view. In regard to Mr. Austin's inquiries, he thought that the tissue did not require the calcium-chloride tube. It might possibly crack if kept in that way. In referring to the superior results obtainable in securing reversed negatives, he meant to convey that improved gradations were to be got by attention in the intermediate process of taking a transparency. The quality of the negative in regard to density could be improved. In reply to Mr. Hyslop, it was necessary to dry the tissue free from gas fumes, or it was rendered insoluble. Lantern slides was a weak point. If a negative were the least thin, no result bright enough was obtainable.

On March 17, the subject is "Collodio-Bromide Emulsion," with demonstration by H. J. Gifford.

Photographers' Benevolent Association.

The Committee of this Association met at 181, Aldersgate Street, on 7th inst., W. Bedford in the chair.

T. Bedding, Edwin Cocking, J. Crocker, J. Humphries, E. T. Hiscock, H. Keen, H. J. Klosz, E. G. Priddle, J. A. Rigby, F. A. De Saulles, O. A. Smith, A. Spiller, T. Watson, L. Wolff, and E. De Zuccato were elected members of the Association.

The correspondence having been dealt with, the meeting discussed at considerable length various methods having in view the desirable object of extending the knowledge of and obtaining additional strength to the Association numerically and financially, feeling sure that all cognizant with the aims of the Association would appreciate and support the Committee in their efforts to help the unfortunate.

Having heard with regret of the accident to the Rev. A. Tooth, who had placed a vacancy in his Orphanage at the disposal of the Association, a vote of sympathy was passed.

Talk in the Studio.

Actinometry. By E. Duclaux.—Oxalic acid in aqueous solution is converted into carbonic anhydride and water by the action of light in presence of oxygen; and this decomposition is not due to any rise of temperature resulting from absorption of the sun's radiation, but is brought about by the visible and ultra-violet rays. In order to secure sufficient contact with the oxygen of the air, the solution is placed in flat vessels, and the same volume of liquid is always employed; also, in order to eliminate the somewhat considerable influence of the concentration of the solution, a dilute solution containing three grams of oxalic acid per litre is employed. The amount of change is determined by titrating with lime-water. If the solution of oxalic acid has been kept for about two months in the dark, it is found to be much more sensitive to the action of light than a freshly-prepared solution—a fact which indicates that the two liquids have not the same molecular constitution. The change is analogous to the ripening of collodion. The same degree of sensitiveness can be imparted to a freshly-prepared solution by exposing it to sunlight for a few hours, and, if a concentrated solution is treated in this way, and is then diluted to the strength given, the increased sensitiveness is transmitted to the dilute solutions—a fact which indicates that the alteration takes place in the molecules of the acid, and not in those of the water. The total quantity of acid decomposed when the same quantity of liquid is exposed during the whole day is much greater than the sum of the quantities decomposed when a fresh portion of solution is exposed during each hour, the difference varying from day to day. There is, therefore, a period of quiescence similar to that which is observed in many photographic and chemical reactions, and which Bunsen and Roscoe have termed photo-chemical induction in the case of hydrogen and chlorine.—*Journal of the Chemical Society.*

Action of Light on Nitrobenzene in Alcoholic Solution. By G. Ciamician and P. Silber.—In continuation of experiments on the transformation of quinone to quinol on exposing its alcoholic solution to sunlight (Abstr., 1886, 695), the authors have studied the chemical change induced in nitrobenzene under similar conditions. Among the products obtained, were aldehydo, aniline, and a quinoline base, probably quinaldine.—*Journal Chemical Society.*

Photographic Club.—The subject for discussion on March 16th will be "Outdoor Outfits."

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

T. B.—1. Not more than ¾ to 1 inch. 2. With a lantern arrangement, such as that described in a leading article. 3. Not very satisfactorily, as the lines would not be straight.

Novice.—You seem to have paid a very full price, considering the number of negatives taken, and the fact that they form a series taken under similar conditions. Unless there was a special agreement that the negatives were to be yours, you have no claim upon them. You can, however, get your prints reproduced by collotype or ink-photo process at a moderate rate.

R. G.—The first lens you mention is a very good one—equal to the best, in fact; but the latter we have not seen, and we know nothing of it.

W. R. Kenan.—It is probably due to mischief arising from impurities in the packing paper, and probably all the stock of plates is spoiled, as far as the edges are concerned.

Residues.—We do not think a licence is required; but it is really a question for a lawyer.

H. W. G.—It is a liquid, and can be obtained from Hopkin and Williams, Operative Chemists, Cross Street, Hatton Garden. You may rather regard it as corrosive than poisonous—that is, poisonous in the ordinary sense of the word.

A. B. C.—1. It is better to keep them separate. Numerous articles on the subject have appeared in the News; see that by J. D. England last week. 2. It will not neutralise the acid, but merely replaces the hydrochloric acid by the weaker acetic acid.

J. D. Webster.—D. C. Dallas, of 9, Furnival Street, E.C., and the Photographic Printing Company, of 62, Basinghall Street, E.C., will supply such a block, and the cost for one of the size you mention will be about 20/-.

H. Harland.—1. It does not matter to which you forward it, provided that it is sent in sufficient time, and that the request to forward a slip is clearly marked on the copy. 2. Perhaps three or four.

W. S. F.—1. We have no doubt that it is sold ready for use. 2. Very little doubt of it. Try the experiment, and communicate the result to us. 3. Probably not exactly; but the two are closely analogous. 4. We prefer the old-style instrument designed by Johnson; but the form you mention is not, as far as we know, sold in the ordinary way of trade. 5. He writes English better than a very large proportion of our countrymen.

Abel Rhodes.—Thank you very much for the prints. The hoar-frost scene makes a delightful picture, and the view of the early engine interests us much. Is it a Newcomen engine which was repaired by Watt, or an engine of this type constructed by Watt? As far as the growth of bushes around it allows us to see, the principle of separate condensation is not embodied in it. We shall regard further particulars as a favour.

W. J. Butler.—The process is described at length in the current Year-Book (see page 187).

THE PHOTOGRAPHIC NEWS.

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18.3.87

THE DENSITY REQUIRED IN NEGATIVES.

Mr. Spurge's paper, read before the Photographic Society, which appeared in our last issue,* is one which, to those who love light reading, will probably be passed over, but it deserves in reality a closer study than many will be disposed to give it. We cannot say that the paper itself is as clear as it might have been, but that is a fault which the majority of men make who have to deal with figures and curves, and who, in the simplicity of their hearts, imagine that everyone else has the—what to them is—elementary knowledge which is necessary for a right understanding of the subjects they may be dealing with. We may remark that it requires almost as much training in the art of writing as in the art of experimenting to render results as useful as they might be. We take it that no paper should require to be read more than twice to impress its meaning thoroughly on the mind of a careful reader. We confess to have read Mr. Spurge's paper oftener than this, and even yet we are not sure that we have fully extracted all the gold which undoubtedly lies hidden in it. There is, however, one point which stands out prominently in it, which, though often talked about, has not hitherto been treated with that exactitude which its importance to every negative maker requires. The point is this: that to pile up density in a negative beyond a certain point is useless. This may sound a platitude, but so far no one has dealt with it in actual figures.

We suppose that in these days of gelatine plates more negatives are rendered useless through over-thinness of deposit in the highest lights than through over-density, and Mr. Spurge puts it in our power to test plates as to their density-giving qualities by recording once for all the greatest density that is practically necessary in the highest lights. He has chosen the range of density for platinum paper, which, we may remark, requires rather a denser negative than for ordinary silver prints. In this he has erred in the right direction.

An outline of the experiment is as follows. Mr. Spurge tells us that in his sensitometer, if the first hole admits a certain amount of light to the paper, the fourth hole will admit half that quantity, and the seventh half that again, and so on, till we find that the eighteenth hole only admits one-fiftieth of initial light. When platinum paper is placed beneath such a sensitometer he finds that when the paper on development is blackened to the deepest black by the light coming through the first hole, and when the second hole shows a less blackening, that it will be found that the paper under the eighteenth hole will remain white, the action of light being insufficient to cause a change in the sensitive compound used. This means that it is useless to make a negative in which the density of deposit in the highest lights is greater than to allow one-fiftieth of the printing light to penetrate.

Most photographers will be astonished at the comparatively small opacity which this necessitates. A very thin deposit of silver reduces the intensity of the light passing through a negative to $\frac{1}{10}$th of the amount passing through those parts of a negative which are practically transparent, and the deposit has only to be half as thick again to reduce it to the required $\frac{1}{50}$th. This matter, as we said before, is one of extreme importance to photographers, as only by a careful study of density are they able to get gradation in the highest lights, and also in the deepest shadows. Mr. Spurge, we may say, insinuates this, if he does not actually say so in as many words. We are quite aware that photographers "who know" are quite capable of estimating the density requisite for a good printing negative; but it is a boon to those who don't know to have a definite value of opacity put before them to which to work. It is comparatively easy to make such a density by trial on a plate, and to use it as a standard to refer to. We have tried this practically, and can recommend it to those who have difficulty in judging.

It would be an excellent idea for Mr. Spurge to issue negatives exposed in his sensitometer in which various gradations of density of deposit are shown and marked. This would enable photographers to form a good idea of what they really ought to aim at such screens might also themselves be used as sensitometers, judging by the curves given in Mr. Spurge's and Capt. Abney's papers, and they would be valuable in that the value of each square of density would have to be measured, giving a guarantee of accuracy which is unfortunately absent in some which are now in the market.

Mr. Spurge's remarks on miminum exposures are likewise valuable, and it is a pity that a discussion on this point was not taken at the last meeting of the Society. There are one or two pertinent questions that might have been put to him, which would have cleared up any points on which he has not been explicit enough. Such dry work as density measurements and the tabulation of results are not the usual pastimes of photographers, and Mr. Spurge is evidently one in a thousand in undertaking them. It is to be hoped that he will continue his researches on these points, the outcome of which must be valuable in the long run, though they may not be appreciated at the moment.

◆

FERROTYPE PLATES WITH GELATINO-BROMIDE EMULSION.

Dr. C. Schleussner, in the *Wochenblatt*, gives some useful hints to those who wish to make positives on ferrotype plates with gelatino-bromide emulsion. He points out that the film of emulsion should be extremely thin, and very short exposures should be given—not more than one-fourth of the exposure which would be necessary in making a negative with the same emulsion.

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* The concluding part will be found on p. 165 of present number.

The development ought to be with ferrous-oxlate developer to which a liberal addition of potassium bromide has been made. After a thorough rinsing with water, the plates are fixed with a potassium cyanide solution containing one part of the salt dissolved in twenty parts of water. Thorough washing is now required, after which the plate is immersed in a weak solution of mercuric chloride (corrosive sublimate) until the image is thoroughly whitened. Again wash, soak in methylated spirit to remove water from the film, and dry at a gentle heat.

Considering that so short an exposure suffices in the case of a gelatino-bromide ferrotype, the writer suggests that they will be useful in many cases; as, for example, when a positive is wanted at once for transmission by post, or in the case of work which has to be done by artificial light. Our readers will see how the gelatino-bromide ferrotype process may do good service in many instances.

FRENCH CORRESPONDENCE.

Astronomical Photography—French Photographic Society—Bitumen Process called Instantaneous.

Astronomical Photography.—The most important application of photographic art to the service of science is certainly that which is now being made for the delineation of the stars. Very remarkable works of this kind have been already accomplished in several countries, and photographic representations of astronomical subjects have been so far perfected as to give the idea to our leading scientific men of undertaking a still more considerable work. We refer to the execution by the aid of photographic apparatus of the entire chart of the heavens. This will allow of the cataloguing of about twenty to thirty millions of stars. A congress of astronomers is to meet with a view of arranging the programme to be settled with the divers observatories which are to work simultaneously upon the chart of the sky. In order that these observations may be rigorously comparable with each other, it is necessary to be in perfect accordance on many matters, both from the astronomical and the photographic point of view. To occupy ourselves only with the latter point: account must be taken of the sensitiveness of the films, of their nature, of the grain of the emulsion, of the actinic intensity of the light of the stars, according to the date of the atmosphere at the time of the operations, and of the means of control to avoid mistaking an impurity of the sensitive film for a star. Note must also be taken of the effect of the colouration of certain stars, if in reality there are those whose emitted rays are red, or green, or yellow. Then, again, these points, assuredly of the highest importance, once settled, will it not be necessary to come to an understanding on the subject of development, so that this may be conducted in a more uniform manner? The congress which has been just mentioned is to take place in Paris, commencing on the 16th of April next; many assents have been received in reply to the appeal of Admiral Mouchez, the director of the observatory. Photography, as we know, will be officially represented. Since a recent visit which we have made to MM. Paul and Prosper Henry, the two astronomers the remarkable works of whom have been the cause of such great progress in stellar photography, we were shown the ingenious means which they have adopted for determining the condition of the atmosphere at the time of operations. They have devised a sort of photometer which directly inscribes the degree of actinism at disposal. This is their method of proceeding:—A sensitive plate being placed in the slide at the focus of an equatorial objective, the apparatus is maintained in repose, in place of being allowed to rotate by the movement of the clockwork which would permit it to follow the sidereal movement. The stars which have passed trace a series of very clearly determined lines parallel to each other, and of diverse thicknesses, according to the dimensions of the different stars. A star of the first magnitude, for instance, will trace the widest line, and a star of the sixteenth magnitude will give the narrowest, least visible line; these differences are easily appreciated by direct comparison. Starting on this basis it may be easily conceived that a special photometer is constructed formed of a series of parallel lines of different thicknesses, and graduated in such a manner that the strongest corresponds to the trace of a star of the first magnitude, whilst the finest will represent the trace of the passage of a star of the sixteenth magnitude. It is evidently necessary, when making this standard of comparison, to select a time when the atmosphere is the most limpid, and the actinic power the greatest. In weather slightly foggy, or even in the case when actinism is less, it is certain that, other things being equal, only stars superior to those which are at the extreme limit of visibility will produce an impression on the plate. These sixteen lines may be numbered from one to sixteen, and will constitute sixteen degrees, serving as photometric base for each observation. Negatives strictly comparable with each other will be those which have been executed under identical photometric conditions; all operations performed under conditions when line sixteen cannot be obtained will be considered as null, in so far as the projected chart of the heavens is concerned. In order that positive prints from these sidereal reproductions may continue to the limits of a posterity far removed from the present epoch, it is important that they should be obtained under conditions of stability as perfect as possible. The idea of printing these positives on glass and vitrifying them appears excellent, and we can see no better means. Attempts have been made in this direction, but by a process which appears to us too imperfect to be applied to reproductions of so delicate a nature. We refer to the process with powder on a bichromated mucilage of honey and gum. It is much to be feared that stars would disappear, drowned in the vitrifiable powder, or that accidental vacancies would produce stars that do not exist, therefore we should prefer a totally different process of vitrification. An image printed on collodio-chloride of silver should be toned with platinum; this last metal by substitution replaces the silver. The collodion is removed, and there only remains to burn in the image. After a first firing, the image, covered with a film of enamel, is burned again, so as to imprison it between the glass and the enamel. In this manner we may be permitted to hope that these reproductions will endure for a very lengthened period; especially if, notwithstanding their vitrification, care is taken to keep them closed in boxes withdrawn from the immediate influence of the gases in the air, of too sudden changes of temperature, light, moisure, &c. Admiral Mouchez, director of the Observatory, has just published at the establishment of Gauthier-Villars a pamphlet of immense interest, wherein the possibility of accomplishing the chart of the heavens is admirably summed up. Just homage is given to the magnificent work in astronomical photography of Warren de la Rue, Draper, and Common, not to mention other eminent precursors of Paul and Prosper Henry. We shall be excused, we hope, for having devoted the greater part of this letter to this enticing question. It is because we think it just now the most important scientific application of photography. We have, besides, the honour to belong officially to the approaching Astronomical Congress, and we shall not fail to keep the readers of the Photographic News *au courant* with the decisions which will be there taken. We refer, of course, to what concerns photographic operations.

French Photographic Society.—The monthly meeting of this Society took place on the 4th of March. Although the number of the communications received was considerable, the sitting was almost devoid of interest. We have yet another emulsion prepared by M. Tondeur, an emulion of gelatino-chloride of silver, an excellent one accord- ng to those who have tried it. Further subjects on the ccasion were the pellicles and paper of M. David, the ew exposure shutter of M. Mendoza, and the kinegraph of I. Francais. This is a sort of detective camera (by inegraphy is meant photography of movement, or by ex- ension, instantaneous photography). The improvements ntroduced by M. Balagny in pellicular papers constituted ne most interesting part of the sitting. These papers ave reversible pellicules. Special frames of very simple odel serve to hold them in the dark-slides. The principal im pursued by M. Balagny is that of facilitating the pro- uction of reversed negatives suitable for collotypic im- ressions, and he has succeeded in it perfectly.

Bitumen Process called Instantaneous.—To close this tter in a useful manner we give a little process which is r from being known by everybody, and which in the egion of frequent fogs is likely to be of great service. The lvantage which it offers is that of uniting the great ensitiveness of bichromated albumen to the solidity of the rotective coating of bitumen of Judea. The metal, zinc or opper, is covered successively with two coats, first with itumen, and then with bichromated albumen. After the omplete desiccation of this second coat by means of a entle heat, the plate is exposed to the light, and then eveloped in an aqueous solution of red or blue aniline; nis allows the image to be clearly seen, so that a judgment ay be formed as to when it is complete. It is then dried, nd the plate is treated with turpentine to which has been lded one-fifth part of benzole. The bitumen is dissolved herever the album not hardened by light has been re- oved by the water, and the lines are left perfectly bare, isceptible of being engraved or left in relief, or fit for noto-lithographic transfer. There is no peeling off under ne albumen, even when the action of the turpentine bath prolonged considerably more than necessary. We re- eat that, thanks to this process, is realised the sensitive- ess of bichromated albumen and the solidity of bitumen.

LEON VIDAL.

NOTES FROM NEW YORK.

EW YORK PHOTOGRAPHIC EXHIBITION—DARK-ROOM LIGHT—DEVELOPER FORMULÆ—EXCHANGE OF LAN- TERN SLIDES.

New York Photographic Exhibition.—The first annual hibition of photographs representing the combined ork of the three leading photographic societies in the nited States—viz., the Photographic Society of Phila- lphia, the Boston Camera Club, and the Society of mateur Photographers of New York—and, in addition, y other work which may be offered by outside amateur professional American and foreign photographers, is to cur from March 26 to April 2nd inclusive, in this city, der the auspices of the New York Society, and promises be an exhibition of unusual merit, size, and interest, ich will doubtless materially advance the cause of ama- ur photography in this country. The Society, at consi- rable expense, has leased a gallery known as Ortgies' llery, 845, Broadway, very conveniently located, thus king it easy for members and friends to frequently amine the pictures. Special arrangements are to be ovided for the exhibition of window transparencies; tern slides will only be exhibited on the screen, and hibitions of this character will occur three evenings ring the week. A catalogue based on a somewhat new n is to be issued: below the name and address of the hibitor will be italic letters arranged in the order and sition of the pictures in each frame, and below this rangement other corresponding italic letters will be ced, progressing downward in a vertical column. posite each letter is printed the title of the ture, and the main facts of how it was made, e kind of plate, lens, developer, and print used, thus giving the visitor at a glance the details regarding each picture. Each frame is to have attached a large sized number, a corresponding one being affixed in the catalogue opposite the exhibitor's name. Already enough season tickets have been subscribed for to ensure the financial success of the exhibition. It is expected there will be at least one hundred different exhibitors, and several interesting exhibits are promised from some of your prominent English amateurs. The Committee of Arrangements (Chas. W. Canfield, F. C. Beach, John F. Granger, Robert S. Redfield, and George E. Cabot) has just appointed the following Board of Judges:—James D. Smillie (Chairman), E. Wood Perry, Jun., C. J. Turner, George G. Rockwood, George C. Cox. The first three are artists of some note, familiar with photography, while Mr. Rockwood and Mr. Cox are well-known photographers.

Dark Room Light.—Recently, the question of a better light for the dark room was brought up before the Society, and a special committee was appointed to make a series of experiments and report the results, which, it is expected, will be of considerabe interest.

Developer Formulæ.—The matter of uniformity in photographic formulæ was discussed. Dr. Janeway held that when an ounce was mentioned, it should be regarded as containing 437½ grains, but that if one wanted to make sure, the safest way was to put it in grains, whether 437½ or 480 were intended.

Lantern Slide Exchange.—The lantern slide exchange among the local societies here is progressing very favourably, two new clubs—one in Chicago, and one in St. Louis Mo.—having recently joined. The lantern slide committee of the New York Society selects the best slides from those contributed by each club to send to England next Fall, in exchange for the London Camera Club's slides. The American branch of the International Photographic Exchange, of 3¼ by 4¼ lantern slide negatives, lately sent out an album among its Americam members containing over 350 different pictures. The year 1887 promises to be a progressive one for amateurs on this side.

New York, March 1st. F. C. BEACH.

BUSINESS MANAGEMENT.

BY CRITICUS.

No. IV.

UPON lines similar to those indicated in the previous chapter, an agreement between the parties concerned may be decided upon whereby an early transfer can, with tolerable safety to the purchaser, be made, and the bargain, whatever it happens to be, secured by means of a deposit. Ten per cent. of the purchase money, or upwards in special cases, is the usual sum accepted by the vendor, payment of the remainder being made as then agreed upon; and at the same time a tacit arrangement should be arrived at regarding such apparatus, stock, and working plant as it may be deemed desirable to take over. The buyer should provide against the possibility of being compelled to purchase anything on the premises for sale possessing a remote connection with the work of a photographic business. In the majority of cases, it would become rather inconvenient for either party to deal with matters of this kind in a short space of time, especially when stock contains much that may be obsolete, and often of greater hindrance than otherwise to beginners, irrespective of the additional expense incurred. But presuming that the facilities for observation already referred to in our last are available, then the purchaser can alone be held responsible should he be saddled with much dead-weight in the form of broken and useless cameras, worn-out accessories, old printing lumber, and chemicals of uncertain purity; in a word, stuff that would probably fail to obtain a bid in any auction room.

The market price of second-hand photographic apparatus is not difficult to ascertain, and when the quantity is unimportant the services of a valuer can certainly be dispensed with. In a general way, an approximate value of a lens or camera may be arrived at by comparison with lists of similar instruments sold by dealers in these goods, whose published catalogues and prices are nearly always comeatable. Failing these, however, there is another plan which may be here commended, viz., that of making a list of the chosen articles at the cost price, and deduct from the amounts thus obtained discounts ranging from ten to fifty per cent., or more, according to the usefulness and condition of each.

Besides the optical appliances above referred to, it is almost certain that the stock of an old-established business will include a quantity of printed matter relating to the concern—stationery, mounts, and other articles too numerous to mention. When not sold inclusive, such things can generally be purchased at a moderate sum, for any ultimate use these goods might be to the vendor is at least problematical; therefore, when it happens that a considerable quantity of such material is in stock, a fairly large discount off the cost may be anticipated.

In determining the value of internal fittings generally, due allowance ought to be made for previous wear. For example, we will suppose that the carpets in the establishment are of good quality, and have been in use over a year, the traffic having been considerable during that time. Under these circumstances not more than sixty per cent. of the original cost would be the maximum value. When the period has extended over two years, thirty per cent. may be regarded as sufficient, and beyond the third year the worth of them would be but trifling. Studio furniture, curtains, linoleum floor cloths, and coloured hangings can be calculated at the same rate. But where especial care has been taken to protect these articles from sunlight and water, the reduction claimed should be proportionate. Throughout any establishment depreciation goes on with tolerable rapidity, and is a matter which must not be neglected.

Book debts are worthy of more than passing observation, and in proportion to the magnitude of these, so is their importance increased. Numerous small items, which in the aggregate represent an inconsiderable amount of money, are of little moment to the purchaser, and in the end it is probable he would be in pocket by refusing to have anything to do with their recovery, except such as refer to uncompleted orders. But should the exact contrary be the case, and the sums owing contain several heavy items in the accounts, then among the list may be found the names of the most profitable and best patrons of the business, whose continued support is of vital consequence.

An amicable arrangement in regard to the debts, then, becomes essential to the well-being of the present, as it does to the future, career of the business; still a purchaser would be acting unwisely if he were to enter into a bond to secure the vendor all outstanding debts, the risk being too great for such doubtful pay. Both parties should, however, become beneficially interested, and this may be done without entailing drawbacks to either. We think such a desirable end may be attained by the purchaser undertaking to render periodical accounts to the debtors in the ordinary course, and at specified dates to be agreed upon, a settlement of the amounts collected be made to the vendor or his representative, minus expenses of collecting and postage, which is best provided for in the form of a commission upon the sum recovered.

Much has been written and said at different periods, in the history of commercial portrait photography, about the arbitrary rule of enforcing cash payments at the time of sitting, and the statement that no books for the entry of debts are kept has been prominently placarded before the public; but however desirable it may be to enforce a strict observance of this condition—and it certainly appears reasonable enough in large communities—we could not at the present moment point to a single instance within our own knowledge where credit is refused to a few special customers; hence the prominence given to book debts.

The presumption being that the purchaser is sufficiently qualified in the practice, as well as the technicalities, of photography to undertake the work of any member of the establishment, should necessity arise for so doing; it by no means follows, however, that he would be acting judiciously in taking any other duty upon himself than that of management, for a time at all events, after the transfer has taken place. For this reason, we would suggest that, whenever possible, arrangements be made with the assistants employed which shall ensure their remaining at their posts. Several reasons could be offered in support of this plan of action, if such were necessary; two will be sufficient for our purpose. One is that assistants who have been engaged in their respective departments, even for a moderate period, are acquainted with the more influential residents of the neighbourhood, and best customers of the business. They are, moreover, tolerably conversant with individual peculiarities and wants of the *clientèle*—a wonderful help towards securing good orders and continued patronage. Again, the fact of these assistants being perfectly familiar with the routine of the establishment enables them to execute their special functions expeditiously and with far more success than could be expected of a fresh staff unaccustomed to the prevailing conditions.

It is always well, in taking over a business, to see that any existing licenses to make use of patented processes or rights be included, as the possession of them is likely to prove useful for advertising purposes, if nothing else. These go with the goodwill. The public—or, at least, that portion upon whom photographers depend for sustenance—are very apt to regard the display of "By Royal letters patent" with the respectful awe which they believe due to merit, and fail to distinguish between patentee and licencee, to the great advantage of the latter, often very long after payment of royalties have ceased. Registered negatives, and clients' sanction with official authority thereto, also included in the goodwill, may at any time prove of exceptional value, therefore attention to them should not be omitted. Arrangements for the display of specimen cases off the premises—at railway stations and elsewhere—form subjects of enquiry, and probability of renewal, if desired, without an extortionate demand in the shape of increased rent. For a similar reason a purchaser cannot be too careful over examining the conditions under which he becomes a tenant. Who keeps the premises in repair, and if the studio is sold with the business, what happens upon its removal? Can a lease be had and renewed, &c.?

The leading features pertaining to the purchase of a photographic business in working order have now been considered, and details which appeared requisite introduced. We now take leave of this part of the subject, assuming that an actual transfer has taken place, and that business is being carried on under the new management. Some further remarks about commercial production will be introduced later on; in the meantime the construction of convenient premises in a suitable locality claims attention.

* * *

HOW TO WORK STANNOTYPE.—No. V.

BY WM. LANG, JUN., F.C.S.

We are now in a position to commence actual printing operations. The paper which is to receive the gelatine picture has been rendered impervious to moisture by a coating of shellac in borax, and as it is prepared on the large scale there should be no difficulty found in obtaining it. Taking a piece of this paper cut to a size a little larger than the margin of the mould, and having pushed back the arch of the press as far as it will go, a small quantity of the fluid ink—enough to cover, say, one-sixth of the surface—

is poured on to the greased mould ; the paper is then placed quickly over the gelatine, prepared side down, the arch of the press brought forward, and the handle pushed up as far as it will go. The superfluous ink flows out into a hollow provided for the purpose extending round the press. After waiting for a few minutes, we may open the press and examine our picture. It is well to take the precaution of cutting with a sharp knife the gelatine that will be found sticking to the sides of the press before raising the arch. The ink that gathers round the press can be made to do duty over and over again. The picture is generally fixed by immersion in a saturated solution of common alum ; ten minutes or even less will be found amply sufficient. To remove traces of the alum, a subsequent washing with cold water is necessary before we proceed to let the picture dry.

If our negative mould be perfect, and all the foregoing operations carefully attended to, we should have, as a final result, a perfect print. It will be obvious that in order to secure complete success with stannotype—or, indeed, any photographic operation—a sort of apprenticeship is absolutely necessary. It could scarcely be expected that the very first print drawn by a novice would be absolutely perfect. No two moulds, for instance, are of the same depth ; we have, therefore, to modify the amount of colouring matter in our ink to suit the requirements of each particular mould. Before bringing to a close, however, these articles on stannotype, it may be well to refer to a few of the more glaring defects the operator will perhaps meet with in his printing operations. A want of sharpness in the picture may be attributed to an insufficiently-washed mould, under-exposure, or not sufficiently pressed in the rolling press. Should the defect be due to the first two named, then clearly there is no help for it but to produce another mould ; if the latter, then the best plan would be to remove the coating of tin-foil (easily done by means of mercury), and press a fresh piece of foil down on the gelatine, taking care to use the maximum amount of pressure possible when putting it through the rollers. Should the proof drawn have a dark tint all over it, the ink used may have been too cold, or there may have been not enough pressure of the under screw of the printing press.

Defective half-tones may be caused by the ink being used too hot, or too much pressure applied, or an over-exposed negative mould ; a fresh mould will be the only cure for the latter. Small white spots in the print may be due to dust on back of paper ; occurring twice in the same place, from dust on glass plate of press. Long white marks starting from the edge can be traced to a high temperature, the paper swelling in the hollows before the ink has had time to set. Should it be found on lifting the proof that part of the ink sticks to the foil surface, either the mould requires greasing, or water has got on from the flannel used, or perhaps sufficient time has not been given for the ink to set. If by mistake the unprepared side of the paper has been used, the print, when drawn, will be found covered in the high lights with small grains. Should the print show uneven—*i.e.*, should one side or corner appear too dark—a remedy can be found by placing under the mould pieces of thin paper where the dark portion is observed.

INSTANTANEOUS STUDIES.

No. 8.—The Photographic Bore.

The P. B. As I was saying, I get a most peculiar kind of spot on my plates. (*Enters into a minute description of his spot.*)

Victim (*who is buttonholed*). Well, why don't you change the plates you are using ?

The P. B. Oh, that's of no use. I've tried all the plates in the market, and still get the spots.

V. (*In vain trying to get away*). Well, then, it's the developer.

The P. B. Impossible. I am most particular over my developer. I'll tell you what I use, and how I make it. It's a dodge of my own. (*Describes developer.*)

V. (*Hoping by agreeing with the P. B. to escape*). Capital. But will you ex——

The P. B. One moment. I was going to ask your opinion of a new instantaneous shutter—my own invention. I think it's better than anything I've seen. I'll describe it to you. It consists of (*goes into unintelligible detai* There, what do you think of it ?

V. Admirable !

The P. B. You see the great superiority of my plan is that it (*repeats description af shutter*).

V. Oh ! I quite see your point. And now if you'll allow me, I'll say good——

The P. B. By the way, did you see what Focus said in his paper he read before the Tripod Society ? I'm going to answer him, because my opinion is (*gives his opinion at much length*). Don't you think so ?

V. Oh ! certainly. But you really must ex——

The P. B. Oh ! but I must show you something I did yesterday afternoon, and in a very bad light. (*Pulls out packet of photographs without which the P. B. never travels.*) What a nuisance : I can't find the one I want. Yet I'm sure I brought it out with me. Wait a bit, I shall find it directly.

V. (*despairingly*). Never mind, I'll take your word for it.

The P. B. Ah ! but there's something very singular in one of the prints that I want to show you. I've succeeded in getting a tone I never saw before—a sort of bluish green violet brown. Well, it is annoying I can't find it. I think it must be in my coat tail pocket. (*Leaves go of button of Victim.*)

V. (*escaping*). Next time I meet you I shall be most happy. (*Exit.*)

ON A METHOD OF ESTIMATING PHOTOGRAPHIC DEPOSITS, WITH REFERENCE TO THE PRINTING QUALITY OF NEGATIVES.

BY JAMES B. SPURGE.*

To determine the ratio of the No. I chamber of the sensitometer to direct light was next undertaken. In a brass plate, measuring about 5 × 4 inches, six holes were cut having the same dimensions as the base of the chambers, three being near each end. Upon the holes at one end three chambers were constructed, two of them having apertures of the same area as No. I ; the third was left open. Over two of the other three holes a piece of glass, and glass with a clear gelatine film attached, were respectively fixed, the third, situated between, being devoted to the registration of the effect of direct light. By putting this into an ordinary printing frame, paper could be exposed simultaneously to the various intensities. The prints so obtained will then, by comparison with one direct from the instrument, give the data for calculating their respective ratios. A series of experiments were made, when it was found that the

ratio of direct light to	No. I.	was	1 : 11·56
,, ,,	open chamber	,,	1 : 6·47
,, ,,	glass and gelatine	,,	1 : 1·48
,, ,,	glass	,,	1 : 1·26
,, ,,	gelatine film	,,	1 : 1·22 1·17

Referring to series A. 31·12, where 8 and 7 were found to be equal, the ratio of No. 7 to No. 1 is 1 : 4, and No. 1 to direct light I : 1156. Therefore,

$$\frac{1}{4+11\cdot56}=\frac{1}{46\cdot24}$$

represents the ratio of number 7 chamber to direct light, and that tint No. 8 on the print from No 1 was effected through a density of 46·24 times.

Curves were plotted taking this tint as the starting point for putting in the respective densities. The ordinates represent these, and the abscissæ the relative exposure given to the various parts of the films above what is required to produce a minimum of effect.

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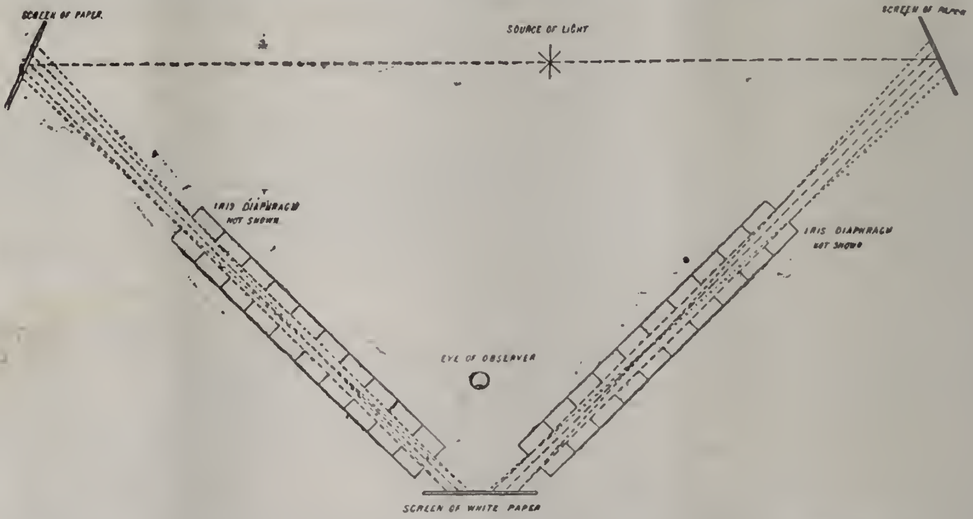
* Continued from page 151.

I would like to mention here that I have been able, through the kindness of Captain Abney, to greatly improve this method of obtaining the data for these results. As an example of my difficulty : suppose I required to estimate tint No. 6 upon a print. On comparing No. 8 in the direct print it would be found too dark, whilst No. 7 was too light. As there was no intermediate between 7 and 8 the interval had to be guessed at. I had intended to construct a sensitometer having a much less ratio for a given number of gradations. During a conversation with the Captain upon the subject, he very kindly suggested a much better plan, viz., to obtain a print having a uniform gradation, and to standardize the various portions of it by comparison with a direct sensitometer print. The intermediate gradations could then be found by simply dividing up the spaces with a pair of compasses. This, on trial, completely overcame my difficulty. I regret, however, that time has not permitted my taking full advantage of it, the results having only been partly done by this improvement.

This graphic method exhibits by simple inspection the variations that occur in the densities for different exposures, from which the sensitiveness can be determined, also the gradation they would give upon a print. Another point of importance these curves elucidate is the advantage possessed in low initial density for quick printing negatives. Curve No. V shows the effect supposing the glass and gelatine could be removed ; No. III and IV represent the alteration due to staining. The action in all the cases is to raise the initial density in the first instance, the disturbance increasing as we proceed towards the maximum. The result of this would be a corresponding increase in the contrast in the high lights of the print, and would be the same as could be obtained by printing in a subdued light. The disadvantage of high initial density is the prolonged exposure necessary. For instance, six times would require a maximum density of 6×50 = 300. The print about four times the exposure before complete gradation could be obtained, which although useful at times is not to be recommended for general adoption.

As my subject relates to the determination of the characteristics of negatives, I shall be exceeding it if I go into the subject dealing with their production. I will, however, give some idea of the application of these curves for that purpose. I would first point out that these are only useful on the assumption that the intensity multiplied by the time of isolation is a constant quantity for these films. I have great doubts of this being true, and consequently any deductions made from these results as regards camera work to obtain the best negative will be liable to some error unless the time agrees in the two cases.

I will further explain : these densities were obtained by permitting relative intensities of light to impinge upon the film for a period of three minutes. To make them strictly comparable, the camera experiment would require the same period of time to be given, the adjustment being effected either by the employment of a slow lens, stopped down, or by reducing the initial illumination of our subject. Referring to my early remarks, dealing with the ratio of the instrument, wherein I mentioned that the gradation was not constant for sensitive bromide of silver films, you will remember that the results shown in my paper of 1883, Series B, C, D, and D^1, that practice did not accord with theory, I think we shall find it to be due to this being a variable quantity.



Until this important point has been further elucidated, a standard of light for photograph purposes will be difficult to decide upon. I therefore in all future experiments, for this reason, intend to increase the initial illumination in order to shorten the period of insolation to about ten seconds, when the results will be more directly comparable with ordinary camera work.

As an example of their application, I will assume it to be constant, and propose as a subject a man in a white blouse with a tarred fence for a background. One reason why I have selected this is, that the apparent and actual contrasts will nearly approximate, when compared with the sensation experienced by the eye and the effect produced upon the sensitive film. For instance, should the surfaces composing the highlights absorb the blue and violet rays to an extent sufficient to make the reflected light yellow, the contrast would remain apparently the same, and by some observers might be pronounced greater in this respect, although an experiment made with a sensitive film would demonstrate it to be much less ; there is a possibility of the latter effects being found equal as regards the amounts of light capable of affecting the film.

Returning to our subject, I propose to consider white paper as a standard for the highest light, and a lamp-blacked surface to represent the next but one deepest shadow. Examining these surfaces, they will be found approximately to reflect 0·4 and 0·002 of the incident light as compared to unity. As a means of estimating these surfaces, and of standardizing the white screen employed with the gas unit, it will be interesting to trace the way their behaviour was studied. To determine whether the ratio of the reflected to the incident light was a constant quantity for various intensities, a simple form of my photometer, which is based on the same principle as the sensitometer, was used. As arranged, it consisted of two tubes one metre long, having a diameter of 0·15, fitted with diaphragms 0·1 apart, having apertures in the centre of 0·08 in diameter, their interiors being well blacked. These were arranged with their axes at right angles, forming the sides of a triangle. Upon each side of the latter, 0·5 away from the end of each tube, in a line forming a continuation of their axes, a screen of the white paper, 0·15 square, was fixed at an angle of 67° 30′, the perpendicular lying intermediate between that and the hypotenuse. On the end of the tubes was fixed a variable aperture, such as an iris diaphragm. The opposite ends of the tubes were fixed at a distance from the point where the sides meet in such a way that the light reflected from the screens of white paper and controlled by the apertures was incidentally near together upon a third screen, parallel to the hypotenuse, as shown in diagram. Any source of light emitting equal amounts in opposite directions in a straight line, parallel with the hypotenuse, and arranged to coincide with it, can be employed. The light is placed at any point on this line. The apertures are then adjusted till the third screen is equally illuminated by both tubes, all light by any other route being carefully excluded. Experiments were made with candles, Argand gas burners from 10 to 80 candle power, and with burning magnesium. In all cases it was found that the area of the apertures varied with the square of the distance of the source of light from the respective screens very closely agreed together. We may, therefore, accept for our purpose that it is a constant quantity. To determine the co-efficient of the reflected light, the screen belonging to the gas unit, and illuminated by it, was made use of, and considered as a secondary source of light when compared with that emitted direct from one of M. Giroud's jets.

Experiment demonstrated that at a distance of 40 c/m. from the latter, the light produced a minimum of effect upon a sensitive film during the same period of time as that required by the former, with its four jets 25 c/m. away from the screen.

Considering the secondary source, the distance travelled by the light before reaching the film would be 25+25=50.

Assuming the light from the four jets had been estimated at this distance their ratio would be found to be

$$\left(\frac{50}{40}\right)^2=\frac{25}{16}$$

that is if the initial light in each case had been equal; they were, however, 4 : 1. Therefore,

$$\frac{25}{16}\div 4=\frac{25}{16\times 4}=0{\cdot}39.$$

The incident light upon the film has been found equal in each case, consequently the loss of 0·61 (the difference) must be due to the presence of the screen.

Returning to these surfaces, the ratio of the reflected amounts would be

$$\frac{0{\cdot}4}{0{\cdot}002}=200.$$

The next assumption is a clear atmosphere, otherwise the suspended particles will reflect light according to their nature and the number that are present. Supposing them to be opaque and in focus, they would in transit from point to point reflect equal amounts of light upon corresponding parts of the film. The effect would be to lessen the control of our subject, which might prove, in certain cases, an advantage, as being in rapid motion they would *not* be registered individually, but each in its turn would either reduce or intensify the light from the various parts, depending upon the amount of light reflected from each particle and the part intercepted for the time being.

The object to be attained is to register the several amounts of reflected light from the various surfaces of our subject in such a manner that correct translation shall be effected upon platinotype paper employing similar films. We have found the control required to be 50; the initial density of our films 2·2. The maximum density would be $50\times 2{\cdot}2=120$ to fulfil the first condition for a quick printing negative. Reference to curve I shows this to be effected with an exposure of fifty-eight times that required to produce a minimum of effect, and twice above the latter to effect a density of 2·2, the control in the exposure being $\frac{58}{2{\cdot}2}$ = say 26. Consequently, the rate of increase in the density for the exposure will be greatly in excess of the control in the intensities focussed upon the sensitive film. We have already found this to be 200. The result would be a want of contrast, more especially in the high lights of the print.

On the other hand, by adopting the mode of manipulation shown by curve II, the reverse would occur—*i. e.*, the shadows would be found wanting in contrast. A perfect curve would be represented by a control of 50 for 200 in the exposure, one exposure effecting a density of 2·2 and 200 times the maximum density of 120, the intermediate opacities lying within a straight line joining these points. This will be found to come between the two cases considered, and would be parallel with the dotted line.

Lastly, a subject having little actual contrast or control can be increased by adopting curve I, or by interposing an absorbing medium between it and the film.

It will have the same effect if the latter plan be adopted as staining in the case of negatives, with the exception that the disturbance will be greater in the shadows than in the high lights.

In conclusion, I trust the remarks I have made will tend to hasten the adoption of means of comparing results in a manner generally recognized, and universally comparable one with another. Any new process, developer, or mode of manipulation will then quickly drop into a proper order of merit with its predecessors.

FORMULAS FOR DEVELOPERS; HOW SHOULD THEY READ?

BY DR. JOHN H. JANEWAY.

How much better it would be, especially to the amateur, if all the formulas were given so many grains to the ounce of water. It would take but a glance to convince him, whether it was a scientific one or not, whether the proportions of its ingredients were correct and capable of producing the best and desired results. What a saving of time and money it would result in; saving in solution of many of the salts used, and especially sulphite of soda, which rapidly deteriorates and becomes useless, or nearly so. Why, then, make them in that way? Why not let the formula read:

Carbonate of soda	... So many grains
Sulphite of soda	... „ „
Pyro	... „ „
Water	... 1 ounce

Carbonate of potash, or soda	... So many grains
Water	... 1 ounce

And then multiply each ingredient by ten or its multiple, and you will have a developer of sufficient quantity and sufficiently fresh to meet all demands; and then, if the plate makers would paste on the cover of their boxes their formula for the developer reduced to grains to the ounce, it would be of great advantage and economy to any one trying one or two plates. The developer could be made up before opening the boxes.

A careful analysis of eighteen published formulas shows a great diversity in the amounts of the ingredients, and

The largest amount of	pyro used to the ounce of water			10	grs.
„ „	sulphite of soda	„	„	... 80	„
„ „	carbonate of soda	„	„	... 40	„
„ „	„ of potash	„	„	... $21\frac{9}{10}$	„
The smallest amount of	pyro used to	„	„	... $1\frac{3}{5}$	„
„ „	sulphite of soda	„	„	... 5	„
„ „	carbonate of soda	„	„	... $1\frac{1}{5}$	„
„ „	„ of potash	„	„	... 5	„

In many of the formulas the amount of sulphite of soda was largely in excess to the quantity generally conceded to be required in proportion to the pyro, 4 of sulphite of soda to 1 pyro. But in one we have sulphite of soda 50 grains, pyro 6 grains. Another formula says his alkali is weak, 40 grains to the ounce of water.

The use of saturated solutions in making up the developer should, I think, be discarded, for the reason that they are uncertain, the changes of temperature and evaporation rapidly affecting them; and then the mixing of two or more saturated solutions oftentimes produce the deposition of more or less of one or both of the salts, but never in equal proportions.

Notes.

Major Waterhouse sends us some very interesting photographs of the fireworks and illuminations at Calcutta in honour of the Queen's jubilee. One of the most remarkable is a view in the Eden Gardens, taken at 7 p.m. with an exposure of seventy seconds—Swan plate treated with erythrosin — carriages, people, and indeed the whole making of the scene, being distinctly visible. Another view, showing a discharge of rockets, is remarkable: one might take them for fountains.

With respect to the series, Major Waterhouse says:—"I fancy there is nothing very novel about them, but these were taken on orthochromatic plates, some Attout and Tailfer's, and others of my own preparation. The exposures for the fireworks were of course very short, and for the illuminations four or five minutes, with full aperture of a nine-inch portable symmetrical for the larger ones, and an eight-inch rapid symmetrical for the small ones. The latter in many cases show details of the buildings, which, however, are not strong enough to print. Nearly the whole of the illumination here was done with small saucers of oil and a single wick placed in rows along cornices, &c.; but with one of the French plates I was able to get a very distinct impression of the line of illuminations along the Esplanade, about one mile and a-half away, with five minutes' exposure. The most sensitive plates I had were Thomas's extra rapid stained with erythrosin and ammonia, but they were rather inclined to fog. I also enclose a photograph taken in the Eden Gardens at the time of the evening promenade, when the Gardens are lit up with the electric light, and the band plays. These also were taken on orthochromatic plates of my own preparation, exposure seventy seconds, with full aperture of eight-inch rapid symmetrical."

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* Abstract of a paper read before the Society of Amateur Photographers of New York.

Among the numerous notions for celebrating the jubilee by something more durable than the fireworks Major Waterhouse has photographed, several have some bearing on photography, and one suggestion we have received from a correspondent is that a Jubilee Hall should be erected, this hall being lined with tiles bearing photo-ceramic photographs representing the world as it is. Perhaps not a bad idea, especially if the plan were kept up, and a new Jubilee Hall erected every fifty years. Such collections would, in time, represent a magnificent store of history.

Like Her Majesty the Queen, His Holiness the Pope is celebrating a jubilee—the jubilee of his ordination as a priest of the Church; but the celebration in this case is to take the form of an educational institution—a sort of free university, in fact. There has been an exchange of presents on this occasion: The Queen presents to the Pontiff a rare and richly-bound edition of the Vulgate, and His Holiness gives Her Majesty a superb mosaic.

Chatting the other day with an artist who has lately gone in for photography, we enquired whether he found the camera of much assistance in his work. "Not so much as I expected; my pictures are mostly figure subjects, and I find that models—the female models, at all events—object to be photographed. You see many of these models are quiet, well-conducted girls, and while they do not mind being sketched, they don't like their features and forms reproduced by photography. I fancy they argue that an artist rarely allows a sketch to go out of his possession, but with a photograph there is no limit to the number of copies which may be made. Besides, the artist generally idealises, while photography is remorselessly literal."

This opinion was endorsed by another well-known man. In his case, however, he contrives to make use of photography, though in a curious way. He is fortunate enough to possess a female relative who, besides being graceful naturally, has acquired the art of posing. His plan is to allow her to follow her own bent in regard to positions, and he takes as many negatives as he can before she tires. The prints from the negatives are then stored away until such time as he wants to draw the figure of a woman. He then looks through his stock until he finds a picture which suits the subject in hand, and completes the study by attaching to it the head of another model. The artist in this case draws chiefly for books and periodicals. How the plan would answer with more ambitious work is another matter.

The contemplated Ambleside railway is being opposed by æsthetic opinion, the most powerful exponent of which is Ruskin. When the Bill came before the Parliamentary Committee on Tuesday, a witness in favour of the Bill mentioned that one of the promoters was "in the fine arts." No doubt this point was put forward as a strong argument in favour of the Bill, because it implied that if a gentleman "in the fine arts" could support the scheme it could not be so destructive to the scenery of the lake district as was generally imagined. The counsel for the opponents, however, rather spoiled the effect by inquiring what branch of the fine arts this promoter followed. "He's in the photographic line," said the witness. "He is the local photographer, is he not?" asked the counsel. "He is more than that," was the answer. "How much more?" "He does a good deal in the fancy way," said the witness, whereupon everybody laughed. This gentleman appears to have been like Mr. Winkle, "a too willing witness." Had he simply answered the question about the local photographer in the affirmative and stopped, it might have impressed the Committee—we do not say it would—as important that a photographer, who maybe supposed to know something about scenery, should be in favour of the railway. But the allusion to the "fancy way" spoiled everything.

At the Photographic Club on the Wednesday before last W. Bedford showed a camera to which some useful additions had been skilfully made by R. L. Allan, notably an internal shutter to work behind the lens, also an adaptation by which slides smaller than the full size could be conveniently used with the camera; and the thoughtful and ingenious way in which the adaptations were made was the subject of comment. Allan, though brought up as a cabinet-maker, went in very successfully for Daguerreotype work when that process was popular, and since then he has been well-known as a photographic worker; but of late he has devoted most of his time to the construction and alteration of photographic apparatus for those who wish to consult with the actual workman in having their designs carried out; and many of the best known improvements in photographic cabinet work have first seen the light in Allan's workshop at 1, Henry Street, Pentonville.

The young Cambridge student who uprooted the tree planted by Gladstone at Newnham, and played off a practical joke on three photographers, has, we understand, been rusticated. Whether the punishment was inflicted because of the tree, or because of the photographers, we are unable to say.

Reports, whether of a business, scientific, or educational nature, are not, as a rule, very lively reading. The board of visitors to the Military Academy of America has enlivened its report, just issued, with a series of photographic views of West Point, including pictures of the cadets at field, artillery, and cavalry drill, and a view of the Academy building. The Board seems to have taken the hint given by Mark Twain when he suggested that the secretary of the Navy should make his report more readable by slipping in a few first-class jokes. What a pity it did not occur to the treasurer of the Photographic Society to give with his report photographs not only of the scratched frames, but also of the badly-framed pictures with the nails sticking out which caused all the mischief!

The puzzle to which we drew attention last week, as to how a lady about to be presented at court is to be photographed, has not been rendered any easier of solution by the attempts of an artist in the *Lady's Pictorial*. Two ladies he has stuck at the very top of the page on a flight of steps, down which the trains meander. A third he has placed at the margin of the page, turned longways, the train sprawling across until it is cut by the margin at the other end. The trains of two more he has managed to curl and raise in the air, where they remain supported by nothing, and remind one forcibly of a dragon's tail. The only hint from these devices likely to be useful to the photographer is that conveyed by the first notion. How would it do if the lady were mounted on a pair of ordinary house steps? The train would float gracefully down, and a foot or so rest on the floor. By this means the whole of the glory of the appendage would be fully displayed. Of course the size and shape of the prints would have to accommodate themselves to the requirements of the sitter. Eighteen inches by six, which would just fit an ordinary music case, might be found useful dimensions. The objection to this plan is that we fear no photographer will dare to suggest it.

Perhaps no more ungracious use of a photograph has ever been made than that recorded in connection with the expulsion of Dr. Von Bulow from the Berlin Opera House. The attendants, it seems, were not acquainted with the features of the distinguished pianist, and the vindictive manager distributed a number of his photographs; the consequence was that having better likenesses or better prints than those which are supplied to the police, there was no difficulty in identifying the obnoxious musician. It is to be regretted that photography was applied to such a purpose.

Here is a hint for photographers who are victimized by dissatisfied and fastidious sitters. Mr. Vilas, the Postmaster-General of the United States, gave an artist of St. Louis a commission to paint the portrait of his wife. The portrait was finished, Mrs. Vilas brought a number of friends to the artist's studio, and everybody was delighted with it. The portrait was sent home, and nothing being heard for some time from Mr. Vilas, the artist sent in his bill. To his astonishment, the artist received back the picture, together with an intimation from the Postmaster-General that there was not the slightest resemblance in it to his wife, and he did not care to keep it for that reason. It so happened that at the same time the indignant artist received an order from a firm of tobacco manufacturers, asking him to furnish them a trade mark for a new brand of cigars, to include the portrait of a pretty woman. The artist had a happy thought, and he inclosed the order in a note to Mr. Vilas, in which he pointed out that as there was no resemblance to Mrs. Vilas in the picture he had painted, he would not, of course, object to its use on a cigar box. Mr. Vilas at first protested, but having previously told the artist that he did not care what became of the picture, he saw he was in a dilemma, and he wisely solved the difficulty by paying the bill and keeping the picture.

PHOTOGRAPHIC LENSES.

BY J. TRAILL TAYLOR.[*]

Discussion.

J. Mayall, jun., said he noticed, in the early part of the paper, a reference to the term aplanatism, but it appeared to him that the expression was perfectly well defined by the classical writers on optics. Coddington, the well-known inventor of the lens which bore his name, in a treatise on the "Reflection and Refraction of Light" in 1829, defined it as meaning freedom from spherical aberration; and that definition was adopted by Sir John Herschel in his famous treatise on "Light" in the "Encyclopædia Metropolitana." He could not but think that if in the description of photographic lenses it was used in any different sense—for instance, as Mr. Taylor employed it, as meaning the angular aperture of a lens—it was an extraordinary misapplication of the term. Of course he did not attribute the origination of that idea to Mr. Taylor, because it had been more or less used in popular treatises on photographic lenses, and even in Monckhoven's work on photographic optics. Mr. Taylor had referred to a great number of lenses of the old type, many of which were quite obsolete, and of no use whatever. On the other hand he had touched on certain lenses recognised throughout Europe as showing the highest point of excellence which had yet been reached. He took it that since the application of the dry-plate process the old Petzval form, in which an extraordinary aperture was given in relation to the focal length, was practically useless, and everyone now used lenses having much less aperture, but where the aplanatism was infinitely more perfect. Reference had been made to the lenses made by Steinheil, in which flint glass was used for the external lenses. That point was taken up by a distinguished mathematician in Paris, some ten years ago, M. Prazmowski, the partner of Hartnack, the eminent microscope optician, and it led him not only to utilising flint glass for the external lenses, but also to combining different kinds of flint glass, and he had a very distinct aim, viz., to get rid, in portrait lenses, of the separation in the back combination, which he obtained by using two different kinds of flint glass for each combination, and thus produced a lens with a very short focus, with each combination cemented, so that the reflection given by the surfaces being exposed to the air was got rid of. One of the first lenses thus made, was made for him, as the result of a long discussion with Prazmowski, and having brought it to London, thought it would be interesting to Mr. Dallmeyer to see it. He remained about an hour while he tested it, but he was surprised to find that, although he was known to have considerable technical knowledge, he had not the slightest conception of the nature of the combination, how the problem of getting rid of the separation of the back lenses was solved, or that the lenses were constructed wholly of different kinds of flint glass, or crown being used. He must confess that even that was now a thing of the past, because it dealt with lenses of the Petzval construction, with great aperture and short focal length, which might now practically be looked upon as out of date. With regard to new kinds of glass for use in lenses, Mr. Taylor seemed to think it was too soon to deal with that question, but he should like to say a word or two on the optics of the future, as they might be developed by new kinds of glass which had lately come into the market. It was perfectly well known in the microscopical world that, some time ago, one of the most distinguished mathematicians in Europe, who had paid special attention to practical optics, Professor Abbe, of Jena, and his friend, Dr. Schott, had worked out an immense number of experiments with the purpose of providing new kinds of glass which would combine a greater number of lines in the spectrum than had been hitherto combined. Of course that in itself was old, some of our most able mathematicians, such as Professor Stokes, Mr. Grubb, and the late Dr. Robinson, having applied themselves to the problem, any time during the last thirty years ; but, unfortunately, their experiments had not ended in any practical result. In this case, however, Professor Abbe being the theorist, and Dr. Schott a practical man, there was a combination which led to a much more exhaustive series of experiments, and the result was that new kinds of glass were really discovered. The earlier experiments they made were not very remunerative ; they took a deal of time, and did not lead to any commercial result ; but the German Government generously came forward, and voted a large sum of money in order that the experiments might be continued. The practical result, so far, had been shown in two ways. First of all, telescopes of considerable aperture had been made by Bamberg, of Berlin, as high as eight inches of clear aperture ; and as regards achromatism there could be no doubt he had reached a point which had never been attained before. That of course would be shown in practical results by the extremely convenient use of deep eyepieces. It was well known that when these were used with a telescope in which the chromatism was imperfect, a flare of clouded fringes was produced ; but with the new glass the chromatic aberration appeared to be more highly corrected. Turning to a point more interesting to himself, this glass had been used for the improvement of microscopic lenses, and a new series had been manufactured by the well-known optician, Zeiss, of Jena, and there could be no doubt that he had attained more perfect corrections through a larger extent of aperture than in any of his objectives of previous construction ; these objectives were therefore aplanatic in the sense in which the term was used by our classical writers on optics. As regards achromatism, the superiority over lenses manufactured with the older media was unmistakable. Seeing these results, he could not help thinking that photographic lenses also might be much improved by the use of this Jena glass. He thought photographers had a right to expect from opticians that the necessary energy should be devoted to the problem of endeavouring to utilise these new kinds of glass, and to attaining results in photographic lenses comparable with those which had been obtained in the microscope. He was informed by Professor Abbe that Steinheil had had a good many samples of this glass, and that he had seen his way, at any rate, to improved forms, and before long he believed there would be an issue of new lenses by Steinheil, made of this material, in which a higher degree of achromatism would be attained with larger and flatter field. If English opticians did not follow in the same path, they would not deserve the support they had hitherto had in England and abroad, where their reputation stood very high indeed. In France, Germany, and Italy, photographers, both amateur and professional, spoke of the quality of English lenses with great respect, and referred to them as being of a somewhat higher standard in the matter of workmanship than almost any produced on the Continent, not in the mere technical execution, but in evenness of quality, so that if a foreigner gave an order to an English firm, he would be almost certain to get a lens of a high standard of excellence. Many people here who had obtained lenses from abroad had not been so successful, and he might say that he had burned his fingers more than once. If you sent for a lens to Paris, you might get a good one, but the chances were you did not.

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[*] Continued from page 155.

A. L. Henderson asked what lens Mr. Taylor would recommend, apart from portability, as best suited for an optical lantern.

F. Shew asked whether the wide-angled lens shown on the screen by Morrison, containing a single back lens, gave straight lines—was it rectilinear ?

W. E. Debenham said he thought justice should be done to the memory of Petzval, and he was sorry to hear his lenses referred to by Mr. Mayall as things of the past, and to hear it said they were infinitely behind newer combinations in aplanatism. According to Mr. Mayall's view they were the only truly aplanatic lenses, because by his definition such a lens was one free from spherical aberration ; and the peculiar characteristic of Petzval's lens which stamped it as the work of a great genius was the freedom of spherical aberration. This he obtained by separating the back lenses, and this had always been considered a great mathematical triumph. All portrait lenses, up to the present, had been constructed on that principle, with, in some cases, slight variations, such as reversing the back lens ; but the great principle was the separation of the back lens into two parts, one of which had sufficient negative spherical aberration to overcome the entire positive aberration of the system, and so render it aplanatic. Several so-called aplanatic lenses had been introduced since ; the first being the single lens of Grubb. Of course the term merely meant that the lenses were on the way to being aplanatic ; perfection did not exist in anything ; those that came pretty near to it were entitled to be so called ; and for a single lens, Grubb's was a nearer approach than anything before. Then Steinheil—another man whose genius would always be admired whenever photographic lenses were spoken of—introduced a combination which he called aplanatic, because it was so nearly so as to allow of tolerable definition with a focal length of only seven times that of the aperture. The Petzval was four times the length, and sometimes less than that; and if any lenses existed more strictly aplanatic than Petzval's portrait lenses, he should be glad to hear of them. Petzval's served as a model for all lenses, and Steinheil's as the model for a host, for all the opticians imitated him. No doubt photographers would wonder why their pet lenses were not referred to in such a paper as the present, but the fact was, if those they were in the habit of using were merely copies or slight variations from these leading original types, it would not be proper, in a scientific lecture, to speak of them as originals. One of the most perfectly aplanatic lenses was Steinheil's portrait antiplanat ; unfortunately, it lacked perfect flatness of field, more so even than Petzval's, and therefore, though it gave exceedingly fine definition over a small field, it required either a curved plate, or to be used only with a very small part of the field, to get perfect definition. Perhaps the most ideally perfect photograph which could be obtained would be one in which the curvature of the field was neglected, the plate itself being curved to receive the image. If the reproducing and enlarging processes were as perfect as they were sometimes said to be, the photograph could be taken in this way, but the plate would have to be in the shape of a bowl ; it would be difficult to manage, to develop, and so on, and then it would have to be reproduced on a flat plate before it could be made use of for printing, and reproducing processes were not as yet so perfect that this method was at all likely to come into use. One lens Mr. Taylor had shown which he believed had gone out of use, which was much to be regretted, the wide angle doublet of Ross. Its place had been to a large extent taken by another combination of Steinheil's, the wide angle aplanatic ; which certainly had the advantage of greater portability. In covering a large field on a flat plate the essentials were—first, the field must be flat ; therefore, the marginal pencils must be much longer in focus than the central ones, and that condition was fairly fulfilled in the lens in question. Another defect in very wide-angled views arose from the angle of illumination ; the corners of the picture received much less light than the centre. The diaphragm opening, looked at from the marginal part of the picture, only represented an oval, having its longer diameter of the same size as the circle which was available for the central part of the field ; in the next place, the corners were further removed from the diaphragm, and the image therefore was more separated, and thus again the corners received much less illumination than the centre. There was yet a third difficulty arising from the reflection at the surfaces of the lenses.

J. Werge said he should be glad if Mr. Taylor could tell him how to determine the focus of a pinhole, as pictures of large and small size could be produced thereby.

J. Traill Taylor, in reply, said Mr. Werge was very well aware that, according to the distance of the pinhole from the screen on which the image was received, so would be the magnitude of the image. If it were six feet away it would be large, if only six inches it would be small. The object of the pinhole was to produce an image of the same dimensions as that given by the lens in question, and that could be done by moving the pinhole backwards and forwards until the two images coincided. That was all that was wanted. He made no mention of the focus of a pinhole. Continuing his reply, he said the best lens for a short studio was a short focus lens, and you should get the camera as far away from the object as possible. With regard to lenses for optical lanterns, according to Mr. Mayall there were none, because it was a thing of the past; but he really thought he could not have been mixing so freely in the photographic world as he ought, or he would know that the Petzval was the lens *par excellence*--the only thing which could be employed for an optical lantern, either for projecting or enlarging, owing to its adaptability. Petzval's portrait lens was the one for the lantern; it was used in the lantern that evening and everywhere else, and he was a little surprised to hear Mr. Mayall say that it was a thing of the past. The most eminent opticians in the world were making them constantly. They might call them universal lens, or the A, B, C, or D lens, or any name they liked, but they were all Petzval lenses, and they were in constant use. The same gentleman had referred to a cemented back. Amongst the first lenses that emanated from the factory of Voigtlander were lenses with cemented backs; they were triple compound lenses of enormous aperture and very short focus, capable of working, as was facetiously said, in a coal-cellar. Voigtlander took out a patent for that again a few years ago, and portrait lenses with cemented backs were things of the present day. Mr. Mayall had also referred to lenses being made wholly of flint. When he described Steinheil's invention, he characterised it as being made of two kinds of flint glass, the denser element outside; and all the lenses of the present day characterised by the term "rapid," with the exception of the one he had spoken of as being American in inception, were made with two kinds of flint glass, the denser element outside.

Patent Intelligence.

Applications for Letters Patent.

3530. Alfred Julius Boult, 323, High Holborn, Middlesex for "Improvements in the manufacture of sensitive photographic films, and in apparatus therefor."—(*George Eastman*, United States.)—8th March, 1887.

3652. Norman Sanderson Brown, 163, High Street, Kirkcaldy, for "The keeping count of the number of prints printed, and to print from photographic negatives."—10th March, 1887.

Patent on which the Seventh Year's Renewal Fee of £10 has been paid.

1117, of 1880. W. Willis, jun. "Photo-chemical printing."

Official Abstract of Accepted Complete Specifications.

Morgan and Kidd, 3269, 1886. "Frame with hinged flaps for folding down and stretching sensitive paper by depressing the centre."

Specifications Published.

3325. Frederick Hazeldine, of Lant Street, in the Borough of Southwark, Contractor, for "An improved indicator and lock for the shutters of photographic dark backs or slides."—Dated 9th March, 1886.

The patentee says:—

The invention consists essentially of a detent or latch capable of being set in such position as to permit of the shutter being drawn out once for the purpose of exposing the plate or film in the camera, and adapted to be automatically set in such other position on the pushing in of the shutter after exposing that it will act as a stop to prevent the shutter being drawn out a second time.

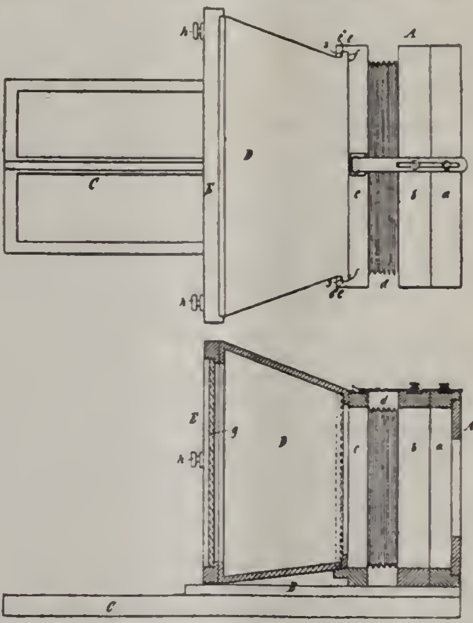
One arrangement is as follows:—The detent is pivoted to the frame of the dark slide or back at one side of the shutter, and is adapted to engage with a notch in the edge of the latter. The detent is acted on by a spring, and it may be set in such position as to offer no obstruction to the drawing out of the shutter a first time, but on the pushing in of the shutter after such first withdrawal it will be caused to assume a different position, and to engage in the notch of the shutter so as to prevent the withdrawal of the shutter a second time. The detent may be pivoted between the two limbs of a U-shaped spring which alternately act on the detent at opposite sides, the other limb for the time being acting as a stop, but the spring may be otherwise arranged so as to accomplish the same end. For instance, a single spring may be so arranged as to act on the detent in opposite directions from its two extreme positions.

According to another arrangement the spring detent or latch is placed at the end of the dark slide or back, so as to engage with the inner end of the shutter. In this case the detent is hooked, and engages with a stud, or its equivalent, on the shutter. The detent may be set for the withdrawal of the shutter by being held back out of engagement with the said stud by a shoulder on the shutter. On the withdrawal of the latter the detent or latch falls into such position as to engage with the stud, on the shutter being pushed in, so as to prevent the withdrawal of the shutter a second time.

3879. William James Lancaster, trading as J. Lancaster and Son, of Colmore Row, Birmingham, in the County of Warwick, Optician, for "A new or improved adjustable diaphragm for photographic cameras." Dated 19th March, 1886. The patentee appears to claim the "oris" diaphragm as applied to photographic lenses.

Patents Granted in America.

357,752. W. Irving Adams, Montclair, N. J., assignor to the Scovill Manufacturing Company, New York, N. Y., for "Photographic camera." Filed Mar. 5, 1886. Serial No. 194,098. (No model.)



Claim.—1. The combination, with the body of a camera provided with a sliding back section, of a detachable portion having flaring sides secured to said sliding back section by means of ribs arranged opposite each other near the edges thereof on the one and sliding in grooves on the other, substantially as specified.

2. The combination, with the body A, provided with the sliding back section *c*, having vertical grooves *e′*, of a detachable portion D, provided with the ribs *f*, faced with felt or analogous material *s*, substantially as specified.

Correspondence.

REMOVAL OF GREEN FOG.

Dear Sir,—I have recently discovered a simple method of removing green fog which is not mentioned in any photographic literature with which I am acquainted, and which may therefore be new to your readers. After the plate is well washed and drained, it is flooded with alcohol, and the surface of the film is gently rubbed with a piece of soft chamois leather moistened with alcohol. The green fog is thus readily removed. Possibly very bad cases in which the green substance has penetrated the film to some depth might not yield so easily. This fact seems to support the view that green fog is a compound of the nature of a dye.—Yours truly, C. H. Bothamley.

Yorkshire College, Leeds, March 9th.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—I regret that Mr. Debenham does not confine himself to facts, but, by "bold defiauce of facts," more clearly demonstrates that his iuterpretation of *either standard* is a mistaken one, and must necessarily be altogether misleading to such whom he now classes as "those who have not the time or taste for examining the question mathematically." I, however, would prefer to address those who have the time and taste referred to for the consideration of a question in which they are themselves interested.

Mr. Debenham follows up a previous statement already answered by me, but which he evidently has not understood, by the assertion that "when several lenses have to be compared, and the stops standardized for rapidity, the first thing is to find the equivalent focus, and then to divide these foci by the number which will give the aperture representing unity, according to the standard in use." Mr. Debenham takes three lenses of foci $6\frac{1}{2}$, $11\frac{1}{2}$, and $17\frac{3}{4}$ inches, *without the slightest reference to their apertures*, but merely gives three methods of dividing these figures by four (the arithmetical, the graphic, and the mechanical !) to give the diameters of the apertures *they should have* in order to mark the first stop 1 by the Photographic Society's standard, and continues the explanation by stating this to be simpler than dividing by 3·162 &c., to give 1 by my standard. How would Mr. Debenham proceed with a lens of, say, 14 inches equivalent focus and 2 inches aperture ? He might try any one of the three methods he gives of dividing by 4, and would obtain $3\frac{1}{2}$ as the result; and hence, in the instance quoted, to obtain the standard unity $\frac{f}{4}$, the lens of 2 inches aperture has an aperture of $3\frac{1}{2}$ inches for the first stop ! "which is absurd."

To correlate lenses with their various stops, find first the ratio of aperture to focus in all cases, aud then comparing these intensities with the standard unity adopted, one obtains the comparative exposures with reference to that standard, by dividing the *squares* of the denominators of the fractions representiug these intensities by the square of the denominator of the fraction expressing the standard intensity adopted as unity. With P. S. standard 4^2 or 16, and with my standard $(\sqrt{10})^2$ or 10—which is simpler? The symbol $\sqrt{}$, which Mr. Debenham considerately enough appears to imagine will terrify many of your readers, is not directly employed at all, for no calculation is needed to prove $(\sqrt{10})^2$ to equal 10.

To make the matter perfectly intelligible, it may be of interest to give two examples. Firstly, how to correlate several lenses of different intensities ; and secondly, how convenient apertures are calculated for a set of stops (giving different intensities) with a particular lens of a given intensity with full aperture.

1. To compare three lenses of $6\frac{1}{2}$, 11, and 17 inches focus, with working apertures of 1·3, $1\frac{3}{8}$, and 1·7 inches respectively, the intensities are $\frac{1}{5}$, $\frac{1}{8}$, and $\frac{1}{10}$. The squares of the denominators give 25, 64, aud 100. For the P. S. numbers divide these by 16, and for my standard by 10, and the figures expressing the relative exposures* are obtained. The P. S. standard gives by calculation 1·5625, 4, aud 6·25, and by my standard, *derived at a glance*, 2·5, 6·4, aud 10.

2. Take a lens of 2 inches aperture, and 14 inches equivalent focus, its intensity ratio is $\frac{f}{7}$, which I give as an intermediary fraction between the ratios of portrait and landscape lenses. To work out a convenient set of stops, proceed as follows :—The square of 7 equals 49.

	Relative Exposures.	Approx. Intensity Ratios, Denominators being Square Root of Relative Exposures.	Apertures of Stops. Focus of Lens divided by Denominators of previous Column.	P. S. Standard. Relative Exposures divided by 16.	Dallmeyer's Standard. Relative Exposures divided by 10.
1 (full aperture)	49	$\frac{1}{7}$	2	3·0625	4·9
twice	98	$\frac{1}{9\cdot9}$	1·4	6·125	9·8
4 times	196	$\frac{1}{14}$	1	12·25	19·6
8 times	392	$\frac{1}{19\cdot8}$	·7	24·5	39 2
16 times	784	$\frac{1}{28}$	·5	49	78·4

These remarks dispose of Mr. Debenham's first, third, and fourth points ; and in reply to his second, I not only "venture to say," but can prove personally, that there are more than four times as many lenses in use of the intensity $\frac{f}{3}$ (the B portrait series) as of the intensity $\frac{f}{4}$ (the A portrait series).

Finally, Mr. Debenham quotes "Litera scripta manet," and in the communication referred to the following passage occurs :—"A method which I published in 1879, *in connection with a proposal to introduce a standard of rapidity for lenses, which standard has since been adopted*, is, I think, to be preferred." (The italics are my own.) I did not even suggest that Mr. Debenham was a member of the committee of standards, or of the Photographic Society, at the time of its sittings, but I am of opinion that the sentence above quoted, sufficed for the conclusion at which I naturally arrived.

The two maiu advantages of the system I have adopted are, then, *firstly*, the great simplicity with which the standard numbers are obtained for facilitating the correlation of several lenses ; and *secondly*, that the standard of unity is more nearly the intensity of the ordiuary quick-acting studio lens. Thos. R. Dallmeyer.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Dear Sir,—As I have reason to be dissatisfied with the management of the Photographers' Benevolent Association, I think it essential that the matter shall be discussed by subscribers, and, with your kind permission, I beg to iuvite all members to attend in numbers, hear my statement, and discuss the matter on the evening of the 24th, at 8 p.m., at 181, Aldersgate Street, E.C.—Yours truly,

328, *Mare Street, Hackney, March 15th.* J. Hubert.

ART PHOTOGRAPHS.

Sir,—I think you will be pleased to hear that art photographs are now becoming most popular on this side of the Atlantic to the exclusion of the foreign chromo and other meretricious gawds which have for so long a time disgraced our picture windows and middle-class homes.

We have one company alone who has issued a catalogue of 210 pages of matter, exhibiting for sale upwards of 100,000 art copies. This catalogue is divided into three parts :—

1.—Reproductions of original paintings, frescoes, and designs by the old masters.

2.—Sculpture, architectural subjects, and miscellaneous views.

3.—Reproductions of engravings, drawings, etchings, and modern paintings, &c.

Thus at least 10,000 original subjects are before us, multiplied into copies as before stated.

In Canada, owing to the cheapness and choice of fancy woods, and the plenitude of turning by water, flower picture frames are produced very much cheaper than in any other part of the globe, and I quite expect to see art photographs superseding every other ornamental attraction in the tasteful decoration of our homes.

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* Mr. Debenham objects to the expression "relative rapidities." I adopted the term implying comparative exposures, the smaller numbers of course signifying greater rapidity.

If I can give any other information to you or your readers I shall be most happy.—Respectfully,

Toronto, Canada. Alex. S. Macrae.

WHAT A DEADHEAD REALLY IS.

Sir,—The note at the foot of page 157, which says a deadhead is American for a bankrupt person, is wrong. A deadhead is a man who travels free on railways and steamers, who gets into theatres free, and all that sort of thing. In America, the President is generally a deadhead, so are the Senators and Members of Congress, so are Mr. Vanderbilt and Jay Gould, so are newspaper men; and you know that however close to bankruptcy Vanderbilt and Gould may come, a newspaperman never approaches it. The Governor of each State is a deadhead, and so is—Yours truly, "Luke Sharp."

Hastings, March 14th.

Proceedings of Societies.

London and Provincial Photographic Association.

On Thursday, the 10th inst., the chief business of the evening was the display of members' transparencies by means of the oxy-hydrogen lantern. The slides were contributed by the chairman (L. Medland), C. H. Cooke, W. H. Harrison, J. B. B. Wellington, and others. A series of portrait studies taken by means of the electric light were shown, and some discussion upon artificial lighting occurred. It was announced that a smoking concert will take place on the 24th inst., at which members and friends were invited to assist.

On Thursday next, the 24th inst., a smoking concert will be given. Commenced at 8 o'clock. Visitors are invited.

Camera Club.

On March 10, **Norman Macbeth**, R.S.A., lectured upon artistic composition. Mr. **Adcock** occupied the chair.

Previous to the reading of the lecture, H. J. Gifford exhibited a Newman shutter which was made to fit into the diaphragm slot, was worked by compressed air, and gave exposures from what was claimed as one one-hundredth of a second to any desired length of time.

Alfred Deed handed round some interesting photographs of large size, showing some effects of the recent earthquake at Mentone.

N. **Macbeth** then proceeded to give his address "On the Composition of the Pictorial" (see page 133). The lecture was illustrated by diagrams and pictures shown by the optical lantern, and treated chiefly of rules of guidance as to selecting the most effective boundaries for pictures and as to the arrangement of the principal objects so as to secure pleasing balance and effect.

The **Chairman**, in calling for discussion, said that many of Mr. Macbeth's remarks, and those indications of figures which he had painted in where required upon the lantern pictures, showed a weak point in photography as compared with painting, namely, the difficulty in regard to placing figures or objects, such as cattle or ships, in the place where there was a felt want.

W. K. **Burton** said Mr. Macbeth had stated or inferred something which was not quite correct when, as he understood him, he suggested that much error could not be made in shutter exposures. There was just as great a difference in effect on the plate between one-tenth and one-twentieth of a second in rapid exposures with large apertures as between ten and twenty seconds in long timing.

C. **Wollaston** asked whether the old masters built up their compositions by recourse to a mathematical arrangement to find *forte* points.

Mr. H. H. **O'Farrell** questioned whether the theory of *forte* points, like other art rules, was not capable of being over refined, and pointed out that in one picture exhibited by the lecturer and divided by him into seven divisions there was an object of interest in each division. He thought that rules of art could never be said to be firmly based unless capable of an explanation grounded on the physiology of vision. The eye, for instance, had only a very limited range of vision, and was constantly travelling over the object viewed. The *forte* points might possibly be explained as being situated on the extreme edges of the area of distinct vision, and thus forming a series of steps leading the eye across the picture. So, again, if a curve were more pleasing to the eye than a straight line, the reason probably was that the eye moved over a curve with less muscular effort than along a straight line. Whatever might be thought of these examples, it seemed clear that until some scientific basis was found, all canons of art must be more or less unsatisfactory.

Mr. **Macbeth**, in reply to criticism, stated that those pictures thrown on the screen without the lines on which the composition was arranged being shown had been felt as pleasing, but they had been treated in the same way as those exhibiting the subdivisions. In seeking to construct a composition pleasing in regard to balance and arrangement, he did not see what else besides such a system there was to rely upon. He would emphasise it particularly in regard to the fixing of the final boundaries of the picture in trimming. As to Mr. O'Farrell's remarks in regard to the picture showing seven figures in a line across the picture, each on a *forte* point, he would say that he did not suggest the plan as serving more than merely an indication in instantaneous work. It would assist in making the best possible arrangement of such a picture when fixing the boundaries.

Derby Photographic Society.

The members held their usual monthly meeting on March 8th, when **Richard Keene** exhibited and described over one hundred lantern slides, made and kindly lent by J. B. B. Wellington, which were greatly admired.

A vote of thanks was accorded to Mr. Wellington for lending the slides, to Mr. Keene for his description of them, and to Mr. Saxelby for the use of his lantern.

Edinburgh Photographic Society.

The fifth ordinary meeting of the session was held on Wednesday evening, March 2nd, the **President** in the chair.

A communication from Andrew Pringle, entitled "A Jaunt in Spain," was read, in which the writer described his experiences, photographic and otherwise.

F. **Briglman** gave a demonstration of the exposure and development of the Eastman Bromide Paper, using the formula recommended by the makers. The exposures were successfully made by magnesium light.

R. **Bow**, C.E., said that in his experience, a short development tended to greyness of tone, while a long and restrained treatment yielded a reddish or chocolate colour.

W. **Forgan** thought that the best results were to be obtained by commencing the development with a weak solution which permitted of complete control and allowed a deliberate judgment of the progress of the image. He got good black, but not brown tones, with Eastman paper.

Dr. **Thompson**, when first experimenting with the Alpha paper two years ago, had conceived that if the same means employed for toning gelatine emulsions on glass were employed for paper films, like results should follow, and he had found that to a great extent it was so. He thought that an exposure exactly suited to the character and density of a negative was required in order to secure the fullest detail possible, and to approach the appearance of the silver print.

J. **McKean** had not seen bromide paper to be so suitable for small work, and the probability was that its chief use lay in the making of enlargements.

Mr. **Wilson** said he had developed a good deal of Eastman paper, and had satisfied himself that a simpler formula than that published was quite efficient. He made a saturated solution of iron and a similar one of oxalate, and to three parts of the former he added one of the latter; the mixture being of a wine colour. This he found to act well, and he got purple-black tones. He suggested that a portion of an evening might also be devoted to the making of lantern transparencies.

W. **Forgan** exhibited some early examples of cartes-de-visite taken by Disderi, who might be called the inventor of this style of portrait. They were in a remarkably good state of preservation.

The **Secretary** exhibited F. Houghton's "Acme" dark-slide and changing-box. The slide division itself contains all the plates or films intended to be used, and which may easily consist of twelve plates or twenty-four films, each one being contained in a thin metal carrier, which, after exposure, is pulled by means of a small rod with a flat hook into the attached changing-box, and the operation repeated till all are exposed.

A silver print fixed entirely by liquor ammonia instead of hypo was laid upon the table by R. Bow, who promised to speak upon the subject at next ordinary meeting.

A number of large photographs of the Grand Observatory now being erected at Nice were exhibited by Professor C. Piazzi Smyth.

Birmingham Photographic Society.

The usual fortnightly meeting was held on the 10th inst., when there was a crowded attendance of members and friends; Vice-President W. J. Harrison in the chair.

The meeting was made special for the purpose of exhibiting the lantern slides sent from America, the use of which was given by the courtesy of the Camera Club. The slides (numbering about 200) were then shown on the screen, Messrs. Karleese and Peace manipulating the lantern and slides. Many of the pictures were of great beauty, and elicited great applause, the instantaneous views of working steamboats, &c., being especially meritorious.

The remainder of the evening was devoted to the exhibition of a number of slides made by the members themselves, and which form the nucleus of a collection being got together by the Birmingham Society, which is intended to be lent to other societies in exchange for the loan of theirs, for the purpose of exhibition at their different meetings.

The subject for the 24th inst. will be "The Humorous Side of Photography," by J. W. Welford.

Leicester and Leicestershire Photographic Society.

A regular meeting was held on the 9th inst. in the Mayor's Parlour, Old Town Hall, the President, Geo. Bankart, in the chair. Two members were unanimously elected.

The President then introduced Mr. Pilsbury, who gave his paper on "Composition in Photography." The remarks were received with deep attention, and the various points touched on were at once recognized. Each point introduced was illustrated with an example either by photograph, drawing, or sketch on the blackboard. The principal feature to be avoided in landscape photography, he said, was the introduction or repetition of straight lines or geometric forms, which could frequently be avoided by changing the standpoint of the tripod; and the undulatory form of outline was to be sought rather than any other to enhance the pictorial value of the photograph. His remarks as to lighting a picture were such as to completely revolutionize the ideas of most of the members, and yet, when brought home by illustrations, were incontrovertible.

Bradford Amateur Photographic Society.

The members threw open their second exhibition of photographic works in the Museum, Darley Street, on March 7th, the institution having been placed at their disposal by the Free Library Committee. The exhibition is confined entirely to the productions of the members, and prizes in the shape of medals are awarded to those exhibitors who in the different classes show the best and most consistent work. There are about 200 productions entered for competitive honours, besides microscopic photographs by J. E. Fawcett, though not for competition. The competition was divided into eight classes, viz., three for landscapes, full-plate, half-plate, and quarter-plate; instantaneous, interior, architectural subjects, portraits, and composition pictures (subject, "Contentment"). The works entered for competition were judged by J. Gunston (Bradford), T. Illingworth (Halifax), and W. Eskett (York). The awards were as follows:—

Class I—Best landscape on full plate and upwards: First prize, H. Forsyth, for the following: "Views in Monmouth," and "View on the River Dart." The second prize was awarded to D. G. Law, for views, "The Matterhorn from the Mettellhorn," "On the Harden Beck," and "On the Wharfe."

Class II.—Best landscape half plate and under full plate: First prize, M. B. Wallace, for "View at Beckfoot, Bingley," "Caton, near Lancaster," "Cottingley, near Bingley." Second prize, D. G. Law, for views "From Stalden up the Nicholas Thol," "Rothhorn and Trift Glacier, from the Riffel," and "Bridge between Stalden and Visp."

Class IV.—For the best instantaneous photograph: First prize, W. S. Smith, for views, "The steamship 'Alexandra' off Great Ormes' Head," "Suspension Bridge on the Conway," and "Conway Castle."

Class V.—For the best interior: First prize, G. L. Salt, for "Drawing-room, Milner Field" (two views), and "Conservatory at Milner Field." Second prize, W. H. Scott, for views of "Cloister, Fountains Abbey," "St. Luke's, Mannigham," and "Borough Court, Bradford."

Class VI.—Best architectural subject: First prize, H. Forsyth for three views of Tintern Abbey. Second prize, D. G. Law, for three views of Heidelberg Castle. For the best portrait and the best composition picture, "highly commended" was attached to photographs by G. L. Salt and C. H. Smithson. The exhibition will remain open for some weeks.

Cardiff Amateur Photographic Society.

The March meeting was held on the 11th inst., the President, S. W. Allen, in the chair.

At the suggestion of H. C. Emery, the hon. secretary was instructed to obtain a substantial album, contributions for which will be solicited from the members, and when filled, presented to the Cardiff Infirmary, and if sufficient prints are received, it is proposed to present albums to other institutions of the town. The hon. secretary would be pleased to receive contributions from friends at a distance.

Society of Amateur Photographers of New York.

Regular meeting, February 8.

The President called attention to the exhibition, to run from March 26th to April 2nd, stating that several fine exhibits from amateurs in England would be sent, and he wanted to have the members of this Society, as many as possible, prepare specimen pictures for the occasion.

The next object of interest is an improved detective camera invented by Mr. Tisdell. It somewhat resembles in outward appearance the Parsell camera which was shown here some time ago, and is provided with a shutter sliding horizontally between the basis adjacent to the diaphragm plate. The diaphragm plate contains the different sized diaphragmatic apertures, and is slid laterally in front of the shutter according as a larger or small aperture may be desired The diagram shows more clearly the working parts. *F* is the sliding diaphragm-plate previously alluded to. The shutter behind it has a rectangular aperture (shown in dotted lines) which, as it passes through the lens, makes the exposure. From one end of the shutter extends a flat connecting rod to the long end of the pivoted lever *C*. On the upper end and front face of the latter is a pin which engages in peculiar arch-shaped release plate *D*, hinged near the end adjacent to the interior of the case, and held upward by a light flat steel spring not shown. The plate has special shaped notches cut in its upper edge for the purpose of tripping and stopping the movement of the lever *C*, adapted for holding the shutter in position when focusing, and when making a time exposure. The release plate *D* is operated from the exterior of the box by a spring button *A* at the corner, and also by the pneumatic piston attached to the right hand side of the box. The piston rod has a peculiar flat

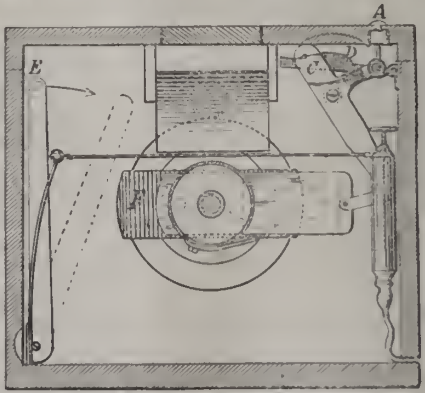

plate soldered to its end which strikes against a miniature roller on the release lever *D* (not plainly shown); the object being to diminish the friction when the piston presses against the release lever. The lever *C* is connected by a wire extending above the lens to the flat steel tension spring attached to the lever *E*. The position of all the parts shows the shutter ready to be sprung, with the spring on *E* fixed at its highest tension. When the pivoted lever *E* is moved to the right in the direction of the arrow the tension on the shutter is released, permitting the same to operate more slowly. Above the lens is located the usual finder.

A Member—How do you get the focus?

The President—There is an arrangement inside for focusing. There is a little milled head here, which, when rotated, causes the pinion attached to the bottom of the vertical shaft to engage in a toothed rack secured to the back frame of the camera, and move the same back and forth. A second shaft on the left hand side of the box holds the rear of the camera, wherever placed, after the focus is secured. An aperture in the back end of the camera allows the operator to see the ground glass for focussing when the cover is closed. The camera can be readily attached to a tripod. It is very light, strongly made, and has a positive movement for the shutter.

The next matter of interest this evening was a demonstration on enlarging by the President.

Dr. Janeway's paper on the Developer was read (see page 167) and the Society went into Committee on weights and measures The struggle of the members with this complex matter is both instructive and amusing.

T. Frisbie—There is one thing that Mr. Ripley refers to in which I think he has made a mistake, and may possibly lead others astray, and that is that the 480-grain ounce is the one most invariably used. I have had quite a good deal of experience in the drug business, and you will find that the druggists purchase their chemicals at 480 grains, but dispense them at 437 grains Troy weight.

Dr. Janeway—You mean 437½ grains.

T. Frisbie—That is one of the methods they have of increasing their revenues. They buy larger quantities than they dispense. Pyrogallic acid, for instance, weighs, as they buy it, 437 grains.

Dr. Piffard—No, it is just the reverse.

F. Ripley—It is the reverse; it comes nearer 480 grains than 437½.

T. Frisbie—I know that in purchasing from druggists you will purchase 437½ grains to the ounce almost every time.

Dr. Piffard—The druggist buys 437½ grains to the ounce, and he sells 480 grains to the ounce; that is it.

T. Frisbie—Not very often.

Dr. Piffard—That is according to Hoyle.

T. Frisbie—It may be your druggist, but it is not my druggist who does that.

Dr. Piffard—I refer to dispensing; but, Mr. Vice-President, it is clear from what I have heard already to-night, that there is a good deal of discrepancy in the weights and measures in use in this country. In your paper you alluded to one point, and that is that, in translating any one formula, it must be borne in mind that an English pint contains four ounces more than an American pint. That is true, but you omitted to state that the English fluid ounce weighs 437½ grains, while the United States measure weighs 486, and when druggists buy their drugs from the wholesale, they buy, as a rule, by avoirdupois; but when they dispense their drugs in prescriptions they dispense, as they are compelled to do by law, by Troy weight, which is 480 grains. Pyro and most of the chemicals that we as photographers buy, are put up in avoirdupois weight almost invariably. The pyro varies, and the packages run from 437½ to 480 grains; that has been my experience with it. They really give you more than they agree to give you. All they agree to give you is the ounce avoirdupois. One of the curiosities of the weights we are using every day may be illustrated by the fact that an ounce of gold weighs more than an ounce of iron, and a pound of iron weighs more than a pound of gold. I find that a man of ordinary intelligence will learn the metric system thoroughly in half an hour, and I have seen men from thirty-five to seventy years of age who have never yet learned the system of weights which we now have in use.

R. Roosevelt—How much does a gramme weigh?

Dr. Piffard—Fifteen grains and a fraction.

R. Roosevelt—How much of a fraction,

Dr. Piffard—$\frac{434}{1000}$

A Member—No, it is $\frac{534}{1000}$

R. Roosevelt—Yes, that is it. Now how in the world can you weigh anything with it? It is like squaring the circle, &c.

A Member—Mr. Ripley has made a statement about weights, and so has Dr. Piffard, and they are both correct. It has been my experience that apothecaries or druggists, when you buy anything over their marble counters, will invariably weigh it out to you by avoirdupois weight—437½ grains to the ounce; and you take the prescription to the same apothecary and he will dispense it at 480 grains to the ounce.

Dr. Janeway—You all see, by the discussions that have taken place here, that the only true way is to write your formulæ in grains to the ounce. I am in favour of 437 grains if you use the term "ounce"; but, if you want 480 grains, say so in your formula.

Dr. Piffard—If you will take any five formulas you can find, and try to work those out throughout grains to the ounce, you will find that you cannot do it.

Mr. Roosevelt—No, sir; there are only a few you can understand. You can understand Mr. Ripley's, and I can too.

Dr. Piffard—For Mr. Roosevelt's information, I will say that I have been struggling with this matter for the last fifteen minutes to see how we could make up a developer of 480 grains, and I find that it would require four different weights to do it; an ounce, half ounce, dram, and scruple, and there is not such a set to be found on these premises. It is better to leave them as they are, unless we adopt the metric system.

A Member—It is the confusion of the formulas that the gentleman exposed, and not the plan of the formula.

C. Walker—What would be the result if this Association should undertake the effort of introducing the metric system among those druggists who put up photographic materials? Suppose we should pass a resolution to that effect and have it circulated among the various manufacturers of these materials which we use, do you think that they would pay any attention to it?

Dr. Piffard—There would be no advantage in it.

C. Walker—One day we have 437½ grains to the ounce and the next day we have 480 grains to the ounce. You don't know whether you have an ounce of 437½ grains or 480 grains; you don't know what you have.

Dr. Piffard—The advantage of the metric system is simply the percentage. It gives you at a glance the percentage of anything and everything, whether one per cent., or two per cent., or any per cent. You glance at it and it tells you whether you have five per cent. or ten per cent. of pyro, sulphite, or anything else. If we can reduce our formulas to percentages we will have it simplified.

C. Walker—These formulas which we have, say, "put in an ounce of pyro to such and such a quantity of water." You don't know whether you have 480 grains or 437½ grains. You cannot tell any thing about it. That is your objection, is it not, Mr. Roosevelt?

R. Roosevelt—No, sir; that is not my sole objection. My purpose is a practical one, that we should endeavour to establish some general system of making the developer like the system of making it up into ten ounces of solution. Take it any way you want, but we should have some fixed amount. Then, if another gentleman disagrees with Mr. Ripley, and says you ought to have ten grains of pyro to the ounce of developer, would know what we were doing and what we were talking about.

Dr. Piffard—Take, for instance, Mr. Ripley's formula: "Sulphite, three ounces Troy; water, ten ounces," and say nothing of the other. You will find that he has got 30 and $\frac{15}{100}$ per cent. of sulphite

T. Ripley—No, sir; it is exactly 30 per cent.

At the third winter lantern exhibition, Feb. 23, 1886, one hundred Cincinnati lantern slides were shown, besides a fine general selection.

Glasgow Photographic Association.

The monthly meeting was held on March 3rd, Mr. **Lang** in the chair. Thomas Nisbet was elected a member.

A quantity of apparatus was sent by A. L. Henderson, among which was a specimen of isochromatic photography produced by the intervention of yellow glass between the object without any staining of the plate.

W. Goodwin said that some fourteen years ago, chlorophyl and turmeric had been recommended for the purpose of making plates more sensitive to certain rays of the spectrum, but very little had been done in this direction until a few years since, when some of the dyes procured from coal tar had been used with marked success for this purpose. Amongst these were the eosines, and the erythrosines, about which so much had appeared in the journals lately. In his experiments he could not say he had made any discoveries; he had contented himself by trying the various formulæ which had been published, and he had got the best results with that published by Mr. Wellington. With this formula, however, he found that instead of soaking the plates in the carbonate of silver and erythrosine at the same time, it was better to soak first in the carbonate of silver and afterwards in the erythrosine, using the two separately. Mr. Goodwin proceeded by the aid of the black board to show by means of curves the effect of various dyes when used in isochromatic photography, remarking anent the dyes that those only that had a chemical action on the film of the prepared plate were of any use.

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Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN. — The usual monthly Technical Meeting will take place on Tuesday next, March 22nd, at eight p.m., at the Gallery, 5A, Pall Mall East, when the subject of "Bromide Prints" will be brought forward for consideration.

ANSCHUTZ'S INSTANTANEOUS PHOTOGRAPHS.—A correspondent writes as follows:—"In your issue of 18th February there is a paragraph by Mr. W. E. Woodbury under the heading of 'Instantaneous Photographs by Anschutz,' which is misleading, as he states that the whole collection of instantaneous photos. by Herr Anschutz, reproduced by the collotype process, are sold at the low price of 10/-. I ordered a copy of the book through Messrs. Trübner and Co., of Ludgate Hill, and received a small portfolio containing fifteen reproductions of the instantaneous photos. (by the collotype process), half-plate size, for 10/-, which can hardly be called a very low price."

DEATH OF LEONE ROMMELAERE.—We regret to hear that this able worker is now no more. Hector Colard, writing from Brussels under date March 16th, says:—"Our friend Leone Rommelaere died yesterday, from a stomach disease. It is a great loss for all of us; he was a very able man, a man of science; he worked a good deal about platinum. He was a founder of the Association Belge Photographie, and was our first general secretary. I may say our Association owes its existence to Rommelaere. He supported it during five years, being at once secretary, treasurer, and chief editor of the *Bulletin*.

THE PATENT-OFFICE.—The report of the committee appointed in December, 1885, by the Board of Trade to inquire into the manner in which the Patent Office was carrying out the Patent Act of 1883, was published on Saturday, 5th inst., together with the evidence taken by the committee. The committee recommend that the practice introduced by the Act of 1883 of warning applicants of the existence of unpublished applications likely to conflict with their own should be dropped. In the unanimous opinion of the witnesses this practice had entirely failed, and it was calculated that the appeal of the provision would result in a saving of £300 to £400 a year. In the case of a patent being abandoned in consequence of a filed but unpublished description, the committee thought that the fees should be returned. The present system of examining applications appeared to the committee to be too elaborate, and they considered that it might be simplified by diminishing the excessive amount of supervision exercised. The alterations, it was believed, would set free some of the staff, who might then be employed in working up the heavy arrears in the publications of the office. The committee further recommend that any amendment required by the Patent Office should be supplied within a month, or that the patent should date from the time when it was so supplied, instead of from the time of the original application; and they advise that steps should be taken with a view of fixing a standard of qualification for the title of patent agent. If the proposed alterations are adopted, the committee suggest the appointment of another committee after a sufficient time has elapsed to test the working of the office.

PHOTOGRAPHIC CLUB.—The subject for discussion at the next meeting March, 23rd, 1887, will be on "Outdoor Outfits."

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

J. F. CULLEN.—Particulars of the methods adopted by yourself would be very acceptable.

TYRO.—It is from ἅλς sea-salt, γένεσις a source, and is applied to the three characteristic constituents of the saline matter of the sea: chlorine, bromine, and iodine. Fluorine, owing to its analogy with the above, is sometimes included. The term haloïde is not often used in English; but when it is used, it is ordinarily used as the adjective corresponding to the substantive halogen, although, by occasion, haloïde is used in the sense of "analogous to a halogen."

J. C.—1. No elementary book on chemistry will cover all the ground; but, as a first book, you had better obtain Roscoe's "Elements of Chemistry," published by Macmillan, and costing about 4/-. 2. There is no such dictionary published, and perhaps never will be, as the best possible book would mislead in many instances.

URANIUM.—1. The formula given on page 275 is, we believe, quite correct; at any rate, it works satisfactorily, which is sufficient for most. The misprint you refer to is one which nine readers out of ten can correct for themselves. 2. It answers in every respect as well as the less intense lenses of the same type, both for landscape and copying. The only disadvantage is that one has to deal with a heavier instrument; moreover, it will not include such a wide angle as the exceptionally small combinations in which the elements are placed close together.

H. G. W.—Compilations of this sort are not ordinarily reviewed in the PHOTOGRAPHIC NEWS, and perhaps one reason is that free criticism would not, as a rule, be acceptable. If the statements on the first column of page 1 are absolutely correct, there is an enormous future for the instruments referred to, and your optical factory should soon become well worth a visit.

E. W. W.—1. It can be obtained from Griffin, corner of Garrick Street and Long Acre. 2. The sample sent is either the genuine article or an excellent imitation.

W. H. HILTON.—Photographers are included in the chemists' and druggists' directory published by Kelly and Co. We have seen a list in pamphlet form, but it appeared to be far inferior to that referred to above.

A. BOOKER.—We can only suggest writing to the person concerned.

H. C. VAN WOERDEN.—We have no description in hand; but, if the contrivance is patented, we shall receive the specification in due course, and shall reproduce anything in it calculated to interest our readers.

H. COLARD.—1. Thank you for the moonlight photograph, which is very interesting. 2. This matter has been referred to our publishers. For the communication since received, many thanks.

J. JACKSON.—The terms bichloride of mercury, mercuric chloride, and perchloride of mercury all mean the same thing—viz., the soluble and poisonous salt which is known as corrosive sublimate, and used by photographers. The term chloride of mercury is, on the other hand, a vague one, and may either mean calomel or the above-mentioned salt.

E. D. P.—1. The spots are probably due to impurities in the mounts. 2. Try Newman, Artists' Colourman, Soho Square.

LOUIS B.—1. The number is in print, and can be had from our publishers. 2. The albumen coating is unusually thick, and this is the reason.

LADY AMATEUR.—1. If you make up the oxalate developer all mixed together, as recommended on page 196 of the YEAR-BOOK, it will keep if preserved in a closely-stoppered bottle, and you can go on using it till exhausted. No. 1. Saturated solution of neutral oxalate of potash. To 1,000 parts of this add 3 parts saturated solution of bromide of ammonium. No. 2. Saturated solution of sulphate of iron. To 1,000 parts of this add 2 parts saturated solution of tartaric acid. For use, take 4 parts of No. 1 to 1 part of No. 2. 2. If you buy your materials well, the cost is not the one you mention. 3. Like the above, it will keep in a well-closed bottle.

The Photographic News.

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For Advertisement Scale see page v.

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25.3.87

PRINTING COLLOTYPES AT THE MACHINE.

A Visit to Waterlow and Sons, Limited.

SECOND ARTICLE.*

The collotyper who can expose by the electric light enjoys one very material advantage over him who works by natural light, as the actinometer becomes a non-esential; and the advantage on the side of the user of the electric light becomes most real when several exposures are to be made from a single negative on one collotype plate, as with the electric light it is comparatively easy to secure equality in all the exposures.

After exposure, the plate is soaked in water until the whole of the soluble chromium compounds are removed, and the film shows no trace of a general yellowness; and it may be noted that Allgeyer recommends that the water be not colder than 9° or 10° centigrade, or warmer than 18° or 20.° It is well, in finally rinsing the plate, to very gently pass the ball of the hand over the film, to remove any surface impurity. The plate is then allowed to dry, after which the film is flooded with one of the etching mixtures already referred to, until the film is thoroughly softened, and the excess being removed, all is ready for clamping down the plate upon the iron bed of the printing machine. It is convenient to put a sheet of white paper between the glass plate and the machine bed, as this enables one to watch the inking-up of the plate. As regards the general management of the machine we may remark that the main point is to commence with a minimum of well-distributed ink, and to increase the quantity according to the needs of the case. The general management requires no special skill, but merely that watchfulness which comprehends a number of disturbing conditions, and traces the effect of the undue influence of any one condition. In fact, the same sort of intelligence which will enable a man to successfully run a typographic machine will serve him in good stead at the collotype machine. In getting the plate into work the cylinder must be thrown off, so that, as the machine runs, the two systems of inking rollers alone come in contact with the plate; and apart from the mere quantity of ink, a modification of its consistency may be needed. If the plate only takes ink on the most fully-exposed parts, the ink must be thinned; while, should the tendency be for the plate to tint all over, a stiffer ink is required. Ordinary commercial lithographic printing inks can be used, and the usual lithographic thinning varnishes are proper for mixing with the ink in order to soften it.

It is not always necessary to have both sets of rollers charged with ink of the same tint or consistency; indeed it is sometimes advisable that there should be two degrees of ink. One point is worth noting, namely, that any variation in ink can be most readily made on the gelatine rollers.

It is very often necessary to so arrange the machine that the bed takes two runs for one impression—or, in other words, to only bring the impression cylinder into action at each alternate run; indeed, at the present time, all modern typographic machines adapted for doing reasonably good work are fitted with the means of doing this, the so-called "double inking" arrangement. More than this, however, can be done in the case of the collotype machines, as not only can the inking be doubled, but also the printing, the sheet remaining held by the grips on the cylinder while a second impression is taken upon the top of the first. This double printing will often enable one to obtain a vigorous impression from a plate which would otherwise give but a weak print; but it necessitates a high degree of constructive perfection in the machine. Speaking of register, we may refer to the method of working to points. The points are under the grippers, and come up at the right moment and set into holes in the grippers, thus holding the sheet to the true point-register during the whole time. The system also eliminates any error in register resulting from the vibration of the lay-board.

Two boys attend to each machine, one to lay on, and the other to take off, and near at hand is a little powdered French chalk with which to rub the fingers should they become soiled with ink.

Waterlow and Sons have been working the collotype machines very successfully for over a year, and we may, therefore, consider that this industry is now established in London.

A point of importance—and, indeed, a matter of discipline very rigidly observed—is to carefully cover each machine at night and when out of work; fluff and dust in the inking gear being very mischievous.

At the Finsbury Works there are also hand-presses for working off short numbers, and the firm has departments where Woodburytype, zinc etching, and other branches of photographic work are carried on.

The machine printing of collotypes, like the machine printing of lithographs, has undergone a long period of gestation, but now the former art may be considered to be fairly born; and as at least two firms are supplying properly and accurately constructed machines for this sort of work, while plates, which will withstand the strain of machine printing can be made with certainty, no person with energy, and a reasonable amount of resource under changing circumstances, need fear to embark in this field of industry.

Much information as to ordinary details of collotypic work will be found in back volumes of the Photographic News, and we may again refer to Allgeyer's book as containing the best and fullest collected information on the subject. (Allgeyer, Lichtdruck-Verfahren, für Hand und Schnell-pressendruck. 1881: Leipzig, Karl Scholtze.)

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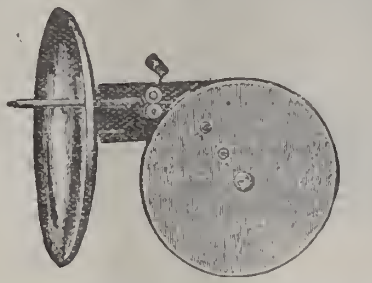
* The first appeared on p. 129

A SIMPLE FORM OF MAGNESIUM LAMP.

At the present time a very convenient and simple form of magnesium lamp is being sold in Germany and Russia at a very trifling cost. There is no clockwork, and the mechanism is so simple that there is but little chance of anything getting out of order, the parts consisting of a flat clamping box for holding the spiral of magnesium wire, a pair of rubber-covered rollers, handle, and reflector.



Each turn of the handle corresponds to a definite length of magnesium wire, and, by counting the turns, exposures may be very well adjusted. Indeed, for many purposes, this simple and inexpensive lamp is to be preferred to the costly ones in which a train of clockwork drives the feed-rollers.

◆

ORTHOCHROMATIC PHOTOGRAPHY.

BY CAPT. W. DE W. ABNEY, R.E., F.R.S.

In treating of the above subject I do not propose to go into the history of this kind of photography, nor to treat of patent rights, but simply to say what I have to say regarding it in as scientific a spirit as I can.

It is well to have something on which to hang one's story, and the Editor has procured a copy of a colour chart published by Cassell's, in which there is a variety of colours, the principal being red, green, blue, and yellow, and mixtures of the same. It was such a chart I first saw in the hands of Mr. Warnerke, who used it for a similar purpose. As each one is identical, it will enable the readers of the News to experiment with the same colours as those which I shall largely make use of, seeing that the chart itself will be my *piece de resistance*. Before referring to this colour diagram for the specific purpose for which it is introduced, I would here remark that the colour of any diagram is never what we call a pure colour, but it is always a mixture of other colours. For instance, the yellow is a mixture of almost every colour. The representation of the solar spectrum is a very nice one as far as it goes, but it differs from the real one in that every colour in it is a compound colour, which is supposed to represent pure colour, which the spectrum is alone able to give. Still the lithographer can only deal with the materials which he has at hand, and with nothing else, and so he has to make on paper the best imitation he can of a pure colour, and this he has done. Another remark I must make is that the pictorial representation of the solar spectrum hardly represents its true luminosity. On a bright day in summer the blue rays are stronger than in winter, and the accompanying diagram will show the proportion of the different colours as measured on four separate days. The top line makes all the colours of the value 10 bring the sunlight as measured at the Riffel 8,000 feet above sea level; the dates of the lines which refer to the other curves are given in the diagram. It will be seen what an enormous decrease there is in the blue compared with the red, as winter comes on to us. The next diagram gives an idea of very accurately measured absolute relative luminosities of the different rays. The height of the curve above the base will give the relative luminosity of each colour. It will be seen that the violet has scarcely a hundredth of the luminosity of the yellow, whilst in the pictorial representation of the spectrum there is no such difference. Had the spectrum been taken on a winter's day the real difference, of course, would have been far greater, as the bottom curve will show.

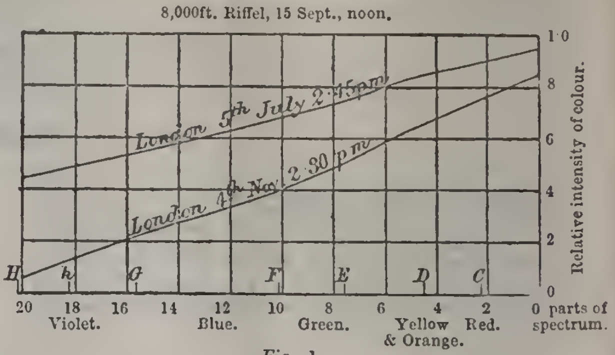


Fig. 1.

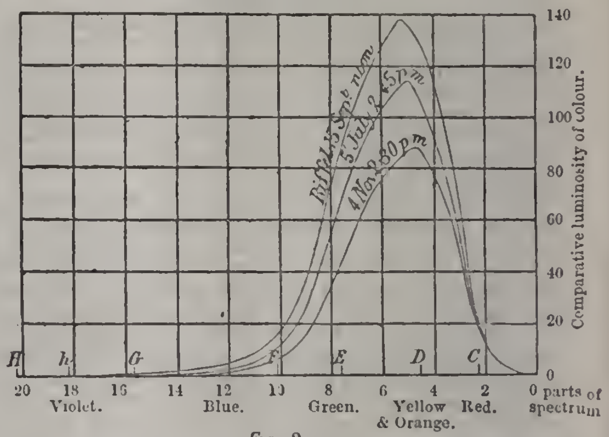


Fig. 2.

Now as the blackest black pigment has $\frac{1}{80}$ of the luminosity of the whitest white, it is evident that no coloured diagram can give the true value of the luminosity or brightness of the real article, since violet pigment is more luminous than black, and white than yellow.

In a good many foreign publications of late, photographs of the solar spectrum taken on orthochromatic plates have been reproduced, and the conclusions derived from these by the authors have been that the most satisfactory results were those in which the whole visible spectrum was shown in a print as a uniform white band. Now it has apparently escaped notice that such a representation, though better than an ordinary photographic representation, is really untruthful. What is required is that the shade of grey representing the violet should be by a tint $\frac{1}{100}$ of that representing the yellow, and should fade off into the red, whilst the ultra-violet rays should not be represented at all. When this is arrived at, the word orthochromatic may then be more truly applied. It is at present almost as much a misnomer as isochromatic.

Now I have been thus particulars in treating of the photography of pure colour, as seen in the spectrum, because it is proximately the basis of the correct reproduction of compound colours such as ordinary pigments. It may, however, be perceived that it can never be absolutely possible to produce accurate orthrochromatism, because photography, however manipulated, will never give the exact shades of black and white of a picture in which the shades are black to grey. This may seem a strange reason, but it is none the less true. Suppose we get a plate which is equally sensitive for equal luminosities in every part of the spectrum, then the spectrum will act exactly as if it were a graduated tint of white light. Now, if we represent the lightest white light by opacity in the negative, and absence of light by transparency, the densities between these two extremes will not represent the variation in the intensities of the light at each point; for certain intensities of light it will be too dense, and for others too much approaching transparency.

Now all pigments are composed of colours which lie in considerable portions of the spectrum, and the luminosity of each colour may be compared with the luminosity of some part of the spectrum. If, then, the photographed spectrum is not correct in luminosity, no more can the photographed pigments be. Q. E. D. We thus see that orthochromatism can at the present time only be approximately true, and we must make the best use of the materials and processes we have at hand.

(*To be continued.*)

A CHRISTMAS HOLIDAY AT THE CAPE—ON THE TRAMP WITH A CAMERA.

BY C. RAY WOODS.

Christmas at the Cape! Christmas with the thermometer at 102° in the shade! Christmas with a bright blue sky, and a sun blazing high up—almost in the zenith. A fraud, a delusion, and a snare—a melancholy humbug, and I'll have nothing to do with it.

Christmas at the Cape, indeed! I do not recollect seeing any effigies of old Father Christmas in any toyshop window here. No enterprising tradesman would so dare to discredit his fair fame in the eyes of the juvenile population of the country. Nay, old Father Christmas himself, were he here, would find his snowflakes disappear as at a touch of Harlequin's wand, and the poor old gentleman himself would find his not too solid flesh speedily melt and ooze through his boots. But the old gentleman knows better than to come here. In the course of the eighteen hundred and odd years he has numbered, he has learnt a trick or two worth more than coming to a clime where he must perforce bring his own liquors or keep up the tone of his rubicund visage with Cape Smoke*, immature wine, or beer impregnated with salicylic acid; so he always confines his visits to the northern hemisphere.

Christmas at the Cape, eh? I know better than that, too. Call it a brief midsummer holiday, and you will be a great deal nearer the mark. I'll resolve to flee from my scientific pursuits, pack up my camera and plates, keep my identity to myself for once, and, unknown and unlooked for, wander forth to see the country with the fresh, evergreen eyes of a stranger, for out of the Peninsula I have not yet been. If I have anything to do with Christmas at all, it shall be for a brief time after the midday meal, when I raise the goblet of local vintage to my lips and drink to absent friends.

Such were the thoughts that passed through my mind prior to the festive season, and the afternoon of the twenty-fourth of December, 1886, found me at Salt River Station, armed with a 7½ by 5 camera, three dozen plates, an extra flannel shirt, two spare collars, and a flask filled with an apology for whiskey. My "plan of campaign" was to take an excursion return ticket to Stellenbosch, but only to go as far as Eerste River, where I would take passenger cart to Somerset West, photograph there on Christmas Day, walk to Stellenbosch on the following morning taking pictures by the way, take pictures at Stellenbosch on the Bank Holiday morning, and return to town by the evening train. I had to slightly alter my programme subsequently, but let me not go in advance of my subject, but tell the story as it occurred, and in the natural order of events.

Away speeds the iron steed at the boiler-bursting pace of eight or ten miles an hour—past the Royal Observatory—Hurrah, I'm free of you for three days!—and over the Cape Flats. The Devil's Peak is receding in the distance, and is gradually being overtopped by its slightly higher neighbour, Table Mountain. Through the desert of ironstone, sand, and scrub, past the Maitland Cemetery, on we go. Now we stop for ten minutes at Durban Station, and, rather inconsistently for one fleeing from old haunts, jump out to speak to a friend on the platform. Knils River—Eerste River—here we are. Most passengers who get out here are going on to the Strand—a dreary, Heaven-forsaken watering-place, opposite Kalk Bay, but on the opposite side of False Bay. Into the Cape cart—thank goodness! this part of the world can provide a comfortable conveyance—and we trot rapidly along. Our fellow-passengers, who are unknown to us, not hesitating to kiss their hands to the occupants of a passing vehicle, so the present writer, known to the fair travellers within, hides his head, not caring to be recognised amongst such a rollicking crew. Up and down, down and up, along the road, through the dreary flats, nothing to amuse the mind save the changing aspect of a ridge of rugged rocky heights that we speedily pass. Anon the wooded village of Somerset West comes into view, and we stop at the door of honest "Joe" Walker, the proprietor of the Central Hotel, a two-storied building, with the inevitable "stoep" below, and a comfortable verandah in front of the top story, the latter having a staircase to it from the outside.

After light refreshment at the bar and ordering supper, I am shown into my room and proceed to brush myself up a bit. "There, I knew I had forgotten something—brush, comb and insect powder." For I am not yet sufficiently acclimatised to lament any absence on the part of the gay and festive pulex. A glance at the brush and comb, a glimpse at the sheets, soon reassures me that if my quarters are not palatial they are at least clean, and I soon find also that if the cuisine is not luxurious it is good, well-cooked, and plentiful—so plentiful as to make me ask who else was going to sup with me, a remark which elicited the reply, "Well, you being a stranger, I don't know your appetite, and I have seen men laugh at a side of bacon and a dozen eggs."

A walk down the street ere the brief twilight has departed; a weed on the verandah with the only too familiar company of the stars, the mind free to wander six thousand miles away to the party grouped round the blazing fire in the old home, that grows dearer with each hour of absence; so passes the evening. Retire to rest at ten. At twelve there come "the waits," a gang of genuine negro minstrels singing at the top of their lusty voices a selection of music-hall ditties and revivalist hymns, determined to please all tastes; and I sigh for the once despised German band. But I heed the nuisance not for long; Morpheus has obtained too fast a hold on me, and the South African waits only come before my mind's eye as a hazy recollection. But they did what a frigate's broadside once failed to do—they partially succeeded in waking me up.

Up at six; breakfast at half past; at seven the boy is waiting. Shouldering my sachel and camera, he follows sturdily behind me, as I pace down the principal street. The bridge over the river at the end of the town is wrongly lighted for a photo just now, and so is the avenue of trees that line the road for a short distance. Then follows about three miles steady tramping over a hard almost level road. A good day for photography, but not a perfect one. No gently shifting cloud to vary the effect of light and shade, or to diffuse the light a little more evenly, and break up the hard contrast of sunshine and shadow, where shadow is to be found. But, happily, the south-easter that rages so furiously in these parts at this season is conspicuous by its absence, and only a gentle breeze comes at slow intervals, not strong enough to stir the scanty brush and shrub that lines the roadside, and scarcely strong enough to cool the brow down which the perspiration is pouring in a copious stream. We are within a mile or two from the foot of Sir Lowry's Pass, a stream of water is running across the road, and a few rows of trees are offering their grateful shade. Refreshed with a deep draught of the inexpensive beverage, we come to an anchor. I set up the camera, and record on my first plate a view of the trees and thatched houses close by, with the mountain and Pass in the background. One house, or cottage if you will, bears on its front the conspicuous letters V.R. on each side of a crown. The loyal legend is necessary, for this is just where one would *not* expect to find a Post Office. Shall I take it? No. It lies a little off the road, and may make a better subject when the sun is in another quarter.

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* The popular term for the national beverage of the Colony, frequently known as Cargo brandy referred to in a previous article. Its composition is indefinite, ranging through spirits of wine and fusel oil to water, blue vitriol, sulphuric acid, cayenne pepper, and kerosine oil.

Soon we are beginning a slight ascent, and my boy is getting out of breath. Ere we leave the trees behind us I give the lad a rest whilst I pencil down the notes which form the basis of this article. A quarter of a mile farther on I look back along the road, take a view with the rough "veldt" or scrubby sandy plain in the foreground, the little hamlet and its surrounding trees in the middle distance, backed by the undulating hills that cut off all but the jagged summits of the range of mountains to the east of Somerset.

Soon we reach a bottle store, and the fact that it is Christmas day, and the place is closed, only makes the temptation to take a drink a trifle stronger than it might otherwise have been. There is a *bona fide* Traveller's Act here, as at home, and I am soon accommodated with a half-bottle of "Guinness" for the sum of elevenpence. As in most distant parts, a glass of good English beer has to be paid for; Cape beer is not quite so expensive, but far inferior; Cape wine is too strongly fortified, and Cape spirits are very cheap and fiery, although by exercising a little discrimination it is possible to get native spirit more wholesome than the largely advertised whiskies and brandies that are sold here at a comparatively high price. Spirits of wine—unmethylated too, for chemical purposes is as cheap as methylated spirits at home; prepared, as it is, from "cango" or "dop" brandy, so the reader may guess how cheap the native article must be. An acquaintance of mine says that he would like to contract to make all London drunk at threepence per head, a transaction that would set him up for life. But this is a digression.

Fifty yards farther on the camera is again put up for exposing three plates panoramically. There are a few hills and farmhouses in the middle distance, but the chief feature is the view of False Bay. From the Devil's Peak and Table Mountain to the right of the picture the whole peninsula can be seen; Kalk Bay and Fish Hoek, Red Hill (at whose foot lies Simon's Town), Smithwinkel Headland, and then right on to Cape Point. To the left is Cap-Hanklip, on the opposite side of False Bay. It is tru that the Range occupies but an insignificant portion of the ground glass, and the result will probably only be interesting from a topographical standpoint; but even that result is worth the expenditure of plates, as it still leaves me six for the remainder of the day.

The wind is getting up a little now, but foliage is scarce, for we are nearly at the foot of the straight cutting along the slope of the mountain, and rock scenery is coming into prominence. At the last turn, before the straight portion constituting the pass is reached, we make another halt, and I "take" the road we are about to ascend. A little beneath us on the slope below the road is a cottage which comes in well at the foot of the picture, but its walls are so remarkably divergent from the perpendicular that it may be difficult to persuade my friends that I paid proper attention to lens and ground glass. The builder evidently did not even adopt the simple arrangement of one old colonial workman I have heard of, whose only idea of building a wall "plumb" was to expectorate from the top, and notice the path of the falling body to the ground.

And now we ascend. My boy's boots are hurting him, he is getting short of wind, and is evidently not at home in up-hill tramping; so, taking the camera on my shoulders, I start on ahead, leaving him to follow at his ease with the plates, but telling him that he must at least overtake a bullock-wagon that is slowly creeping up the road. A needless caution, for I am near the top of the pass, my camera is in position, and my plate ready for exposure long after I left them behind me on the road. My pipe is lighted and half burnt out ere the jaded oxen can get in advance of my position. I seize a favourable moment to expose, then complacently feel that my developer will bring to light a characteristic and not unpicturesque feature of Cape scenery; the rocky mountain, the road cut along its side, the native leading the seven yoke of oxen dragging the laden wagon, the old Dutch driver with his long whip, and Cape Hanklip Mountain stretching down to the sea. And I did get all—all but the whip, which moved too quickly.

We soon reach the top of the Pass, and I expose a plate on an opening in the rocks through which may be seen Cape Point, some twenty miles away. Another plate on a singular mass of rock that wants an old Rhine castle on its summit and appears singularly incomplete without it. Then leaving the boy to take charge of the traps, I climb to the highest neighbouring ridge, from which I can see the whole of the Bay, the long chain of mountains inland, and the verdure-clad velley at their feet, with its trees, farms, vineyards, and patches of corn-land interspersed here and there through the far-stretching Veldt, the Pass I had come up, and the other side of it leading to the village of Palmetta, whose white-walled farm-houses appear like tiny toys; and then my view is arrested by the desolate, ragged heights which I presume must be near Caledon.

Retracing our steps, I expose my tenth plate on a portion of the Pass where the rock above has been blasted away, and the slope below has been built up with blocks of the detached stone, just as one may see in any mountain path in Switzerland, and in many other parts of the world besides. The camera is then wrapped in its dark cloth, the legs are folded, and the whole slung over the shoulder, for it will be some time ere I expose another plate. Returning to the Post Office previously mentioned, the camera is again unpacked, and the white-thatched houses surrounded by trees are taken on number eleven. As I anticipated, I lost nothing by waiting a few hours. Once more is the camera packed, nor is it opened again till we reach the bridge near Somerset, where my last plate is exposed and my photographic work of the day concluded.

I sat down to my solitary meal. So hungry was I that my whole attention was given to it, and it was not till some plum pudding was placed before me that I recollected that this was indeed Christmas Day. That I was alone and solitary seemed bad enough, but as the clock struck five I pictured the family party "far away" doing at two o'clock in England what I was doing at five in South Africa, *i.e.*, drinking perhaps to absent friends. I . . . , it was the first weak point in my programme, and I went upstairs to sleep. . . . .

It was about half-past eight o'clock when I heard some merry roysterers approaching the hotel. As they drew near, it needed little knowledge of Colonial manners and customs to inform me that here were the "young bloods" of the village, or town if you will, with their friends, coming to the bar to finish the carouse which had been arrested in their own homes by a most thorough emptying of bottles. Anything for a little jollity, and, being fresh myself, I had no hesitation in joining them. Glasses round is the only introduction needed. And so glass followed glass, song followed song, chorus followed chorus. As many of them at last dropped out, and only the most hard-headed and experienced drinkers were left, I slipped upstairs whilst still sober, and in a few moments was trying to snore out an accompaniment to the Bacchanalian chorus that the remnant of the party were inarticulately singing.

(*To be continued.*)

CAMERAS, ANCIENT AND MODERN.

BY EDGAR CLIFTON.*

In commencing this paper, a reference to the simple camera-obscura, invented by Baptiste Porta in 1650, may seem of little interest, but it demands some attention, inasmuch as its pictures were admired and wondered at for nearly 200 years before any successful attempt was made to fix them. History, certainly in the case of cameras, repeats itself, for when the camera-obscura was employed for sketching, the inversion of the image was found to be inconvenient, and a plane mirror was fixed at an angle of 45° to rectify this. This arrangement has been over and over again invented for the use of photographers, perhaps on an average once a-year.

Amongst photographic cameras the simple box form is the first to claim our notice, and it is certainly worthy of more attention, especially from those who make or adapt their own apparatus, than is usually accorded to it. For much outdoor work it is all that can be desired; it is perfectly rigid, requires no putting together, and for small sizes is quite as portable as any of the more prententious modern articles. The camera itself being a plain strong box, answers admirably as a packing case to hold the entire kit, lens, dark slides, and cloth; it can be readily turned on its side for vertical pictures; and I can say from experience that for seaside work in windy weather it is the handiest of instruments. A slight departure from its primitive simplicity in the shape of a rising front makes it almost perfect. Now for its defects. It can only be used with one lens, and this must have either a rack-and-pinion or sliding adjustment, and it does not look so scientific as a complicated patent double-acting, reversing frame, swing-back camera, so that people who don't know anything about photography won't think so much of you when you take it out. Still the fact remains that a simple cardboard box covered with leather and fitted with a nine-inch portable symmetrical lens is in daily use for outdoor work by one of our most ingenious professional photographers, one who has, moreover, invented more than one camera possessing novel and useful points.

The photographic art was not, however, very old when its disciples found out that the plain box camera was not capable of such adjustments as would render it available for universal use. In the first place, only one, or at most two lenses of different focal length could be used, and a means of greater range of focus was required for portraits at various distances, not to speak of copying and enlarging. An inner sliding body was introduced, enabling the body to be extended to about one and three-quarter times its original length, and this form has survived to the present day.

This type of camera, though convenient enough for indoor use, soon proved too clumsy and heavy for the landscape artist, and between the years 1850 to 1858 quite a host of portable and folding cameras appeared on the scene.

As most of these are now quite obsolete, I will leave the inquirer after them to seek them at the shops of second-hand dealers and pownbrokers, and speak of the only two which can be said to have survived till now. The simplest of all portable cameras is one having a flexible bag for a body with a simple frame at back and front to carry the lens and dark slide. This possesses all the advantages of the simple box, with the added one of lightness and portability. The well known Scenograph, which has received the commendation of so distinguished a photographer as Captain Abney, may be taken as a good example of this class.

The other, and more important type of portable camera, is that now universally known as the bellows body. This at once attained the precedence over all other forms, and has held it up to the present. On and about it everything that photographic ingenuity could do has been done, with the result that such perfect adaptability and precision has been attained, that the modern camera can almost lay claim to be akin with the telescope and microscope as a genuine scientific instrument, scientific in its construction as well as in its object.

Before proceeding to discuss the details of the modern camera, a glance at the many cameras produced during the long reign of wet collodion may prove of some interest. Then the double dark slide was a rarity, and numerous plans were devised for preparing and developing the plate in the field; for the dry plates of those days, though sometimes satisfactory, were seldom trusted by the operator who wished to make sure of getting printable negatives. Mr. Scott Archer, the inventor of the collodion process, introduced the earliest of these, and he was speedily followed by a host of others. Some of these were fearful and wonderful in their design. One actually contained material for three dozen half-plates, including spirit lamp, varnish, and even powder colours for tinting the finished pictures. A full-sized tripod made its appearance on turning a knob, and the whole apparatus could be "carried by a lady without attracting attention."

A practical apparatus of this nature was introduced by Dubroni, of Paris, and was for many years sold in London. It consisted of a water-tight chamber, with the lens in front, and a suitable receptacle for the plate at the back. The plate was collodionised and placed in position, the lens closed, and the silver bath injected into the camera itself, and allowed to flow over the plate. When a sufficient period had elapsed, the bath was poured off and the plate exposed. An iron developer was next squirted into the camera, and was replaced by changes of clean water; when development was complete, the plate was then removed and fixed in a separate dish. The inventor did not recommend putting hypo in the camera.

The same idea was improved upon by Professor P. Smyth on his journey to the Pyramids. There he used a small metal camera with small ebonite baths with glass sides as dark slides. The plate was collodionised, placed in the bath, and exposed and developed when convenient in the ordinary way. These instruments, although useful for some scientific purposes, failed to find much favour with photographers in general, portable tents being mostly preferred, and we will now pass on to a class of cameras once common, but now almost extinct—those designed for stereoscopic work. Opticians still advertise pairs of lenses, but how often is a pair seen in use? In the face of the admirable and suggestive paper which our President has written in this year's *British Journal Photographic Almanac*, it may seem superfluous—nay, almost presumptuous—to say anything of them; but when the subject of cameras is to be dealt with, binocular cameras must not be left out; and even the less generally known single stereo camera, with which the name of Latimer Clark has been for so many years connected, deserves a word. With this camera a baseboard at least double the width of the body or more is used, and the camera slidden from end to end, exposing half the plate at the time, This method possesses the great advantage of being capable of giving positives on glass or paper which do not require to be transposed, as in the case of the ordinary binocular stereo camera. The movable central partition used when an ordinary camera is employed for stereoscopic pictures can also be usefully employed in taking single pictures of smaller dimensions. Thus, it may be used for bisecting the plate horizontally as well as vertically, thus giving the power of making panoramic views, while with the stereo division in its normal position, two dissimilar views may be taken on the same plate, while the addition of cardboard or tin shields enables an almost indefinite number of subjects to be taken on one plate. Of course it is understood that a revolving or horizonsal sliding front is fitted to the camera.

The bellows-bodied camera in its modern form comes next, and it will be best to at once decide what must be regarded as *desiderata* in what may be termed a general purpose camera. Firstly, and obviously, it must be perfectly light-tight, and some of the cheaper makes do not meet this condition. Secondly, it must be rigid. Thirdly, it must possess considerable power of moving the lens to any part of the front board; and fourthly, it should possess a range of focus from half to two and a-half times, the longest side of the plate intended to be used thus permitting the use of wide angle and long focus lenses.

Some one will now probably ask, Why is the swing back not reckoned as an essential to this? I can simply reply that one of our most experienced out-door workers makes all his pictures, including many architectural subjects, without ever using a swing back, and no convergence of the lines can be detected.

A short description of types of out-door cameras now principally used may be of some service, and it will be convenient to divide them into classes.

The first we will call the ordinary bellows-body camera, a pattern which has, until the last few years, been the favourite for landscape work. In this form of camera, the length to which it can be extended is limited by the fact that the baseboard is single, and that it has be folded up against the focussing screen, thus giving the height of the camera *plus* the depth of the rigid part of the body as the greatest range of focus attainable. Many excellent cameras of this type are now in use, and can be rendered available for long focus lenses by the addition of an extension front. Every improvement has been added to this type of camera, but it is now being rapidly superseded by the more modern, or long focus camera. The pattern most generally approved is identified with the name of Mr. George Hare, and many of the instruments subsequently issued bear a striking family likeness to it. In this camera a great length is obtained by making a second baseboard travel over the original one by means of a rack-and-pinion, the back being hinged on to the fixed baseboard, while the front can be clamped on to any part of the moving one. These bolts, or clamps, also provide an excellent side swing to the front, as the arrangement of the back does not allow it to be placed there. This form of camera has one slight defect—the back swings from the bottom edges, not from the centre, the theoretically-correct position. This necessitates the focussing after the view is arranged on the ground-glass; not a serious trouble, but one to be avoided, if possible.

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* A Communication to the North London Photographic Society.

The beautiful cameras of Mr. McKellen, of Manchester, are built on much the same lines, but with several useful modifications. Amongst these may be named a revolving front with the lens placed excentrically, so that half or quarter-plates may be taken with the help of metal shields, a circular tripod top revolving in the baseboard and a swing front, so that no matter in what position the camera is placed, the axis of the lens can be placed opposite the top or bottom edge of the plate.

Another form of long-focus camera is that in which the baseboard, instead of having its halves sliding over each other, has them arranged as in the old form, one folding over the focussing screen, and the other over the lens, a hole being cut for the lens to peep through. This arrangement is very useful for wide angle lenses, as there is then no baseboard to cut off the foreground, a defect to which some of the long-focus cameras are liable. Cameras of this type have been introduced by Mr. George Smith and Mr. B. J. Edwards.

Besides the foregoing typical cameras, and leaving out the universal or studio form, there have been many cameras introduced for special purposes, all of which it would be impossible to speak of now; but the detective camera demands a little attention. Here the object has been to make the apparatus look as unlike a camera as possible—a book, a brown paper parcel, or a small portmanteau being examples of outer covers. With most of these the ordinary dark slide is used, but in some the plates are supplied from a small changing box, as in Marion's Academy camera, or automatically, as in Mr. J. A. Harrison's metallic camera, or the vest camera, which only requires the operator to wear a soup-plate-like arrangement under his vest with a lens peering through his button-hole.

So far, only the camera itself has been dealt with, but dark slides and changing-boxes must now be glanced at. In the earliest camera these were entirely wanting; the camera itself had to be carried into the dark room, the sensitised plate or paper fixed in position, and the whole apparatus replaced on marks which had been made at the time of focussing. The inconvenience of this was soon felt, and we find that Daguerre employed a dark slide opening with hinged doors down the centre. Almost immediately this was superseded by the ordinary single dark slide, which has remained in use almost unaltered to the present time. A few modifications in the shape of draining troughs for wet plates, and various plate-carriers capable of adjustment, being nearly all there is to chronicle, although a shutter, somewhat on the principle of an iron shop blind, ought not to be passed over. The double dark slide is of almost equal antiquity with the single one, and has survived from the calotype days with but little modification, the principal improvement being the introduction of shutters which could be entirely withdrawn from the slide, the aperture being closed by a spring flap lined with velvet. A cheaper form of double slide has a solid frame, and the plates have to be inserted from the front.

With changing-boxes there has been far greater variety. In the earliest forms the plate was shifted into the camera itself, an arrangement only suitable for small cameras. The ordinary dark slide naturally came into use with the changing-box, and the best type now in use does not differ very much from those made by Ottewill many years ago. The great defect of changing-boxes is the liability there is of plates jamming in process of changing, and few of our modern dry plates are sufficiently fine to size to entirely avoid the chance of this happening.

It is, perhaps, hardly allowable to class the roller-slide or roll-holder with changing boxes, although it certainly belongs to the family, and it will be hardly necessary to describe the modern types, as these have been so fully described and illustrated recently; but it may be well to give the history, as far as we know it, of this piece of apparatus. In the April number of the *Journal of the Photographic Society* for 1856, Mr. A. J. Melhuish described a roller slide which he had just then invented. It consisted of a rather thick dark slide, carrying two spools or rollers, from one of which the sensitive paper was wound off to the other as required; a small yellow window in the back allowed the operator to see when a fresh length was in position; a plate of glass in front, and a board pressed against the back of the paper with springs, ensured flatness of the sensitive paper, and completed the arrangement. This idea seems to have been little noticed, probably owing to the fact that for many years paper negatives were quite out of fashion, and it was not till a considerable time afterwards that Mr. Warnerke introduced an improved roller slide, which he designed for use with paper temporarily coated with collodio-bromide emulsion. This slide possessed some very good points, amongst them the revolving shutter, and an ingenious measuring apparatus, which denoted, by ringing a tiny electric bell, when a fresh surface was in position. Mr. Warnerke's slide stood the test of practical work, and has now, I believe, been adapted to the new gelatine negative papers. Finally, the Eastman-Walker slide came prominently into notice, and seems to have quite fulfilled the promises of its inventors, and the expectations of those who have purchased it. Since the introduction of this slide a host of others have appeared, but none seem to differ enough to be mentioned in this paper, which can deal only with types of apparatus.

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THE PERMANENCY OF GELATINO-BROMIDE PRINTS.

BY A. P. LAURIE.

In the number of this journal for October 8, 1886, a preliminary paper appeared on this subject, giving account of certain experiments begun by Mr. Gifford and myself.

At that time a considerable discussion was in progress in the photographic journals on this question of the permanency of the Eastman prints, a discussion started by the remarks made by the Autotype Company in a printed circular, in which they stated that they did not believe in the permanency of prints prepared by that process.

In my paper I stated my conviction that the only satisfactory method of settling such a question was for some authorised committee to prepare, with the greatest care, prints of every kind—silver, platinum, &c.—and put on record their method of preparation, and for those prints to be hung up in some public building, where they could be kept safely, and reported on at intervals. In this way we could supply posterity with accurate information on this subject. I am sorry that no one has taken up this idea, as it is the only legitimate method of investigating this matter—a matter of very considerable importance.

Nevertheless, Mr. Gifford and I thought that some information might be obtained by experiments of shorter duration, and therefore we prepared some gelatino-bromide prints for this purpose, and published our method of preparation with a view to any criticisms that might be made. Several letters appeared on the subject in the *British Journal of Photography*, of which I took note at the time; and two of them are of importance. In the first place, Mr. Pringle wrote, objecting to our method of fixing the prints. Owing to a mistake on our part, we used saturated hypo, which, he stated, would not fix the prints. On enquiring, I found very contradictory opinions were held on this subject, though all agreed that it was not so suitable as a more dilute solution.

Nevertheless, I believe our prints were fixed, and for the following reasons:—In the first place, they were kept for twenty-five minutes in the saturated hypo, and then placed for five minutes in fresh hypo; this ought to fix any print. In the second place, some unexposed prints so treated, on analysis, contained a hardly detectable trace of silver. However, objections having been raised, we have decided to prepare a fresh lot of prints, and subject them to the same tests.

The next criticism of importance was from Mr. Walker, of the Eastman Company. He declared that he would accept no test except that of time, and that it was unfair to argue from the behaviour of prints under a large quantity of a given gas for a short time, to their behaviour when exposed to the same gas diluted with air for a long time. On the whole, I agree with Mr. Walker in this matter, but I presume he would accept, as a strong evidence in favour of the permanency of his prints, the fact that they were uninjured by strong doses of a particular gas; and similarly, if they fade under its influence, though not proving that they are not permanent, it distinctly places them among the suspects.

Our method of experimenting was to take several of the prints prepared according to the methods previously described, and cut each into three. One piece was kept for reference, one piece was placed in moist gas mixed with air and exposed to light, and one piece was placed in moist gas mixed with air and kept in the dark. Here I might say that it is hardly fair to plunge a print into a liquid, as was done by Mr. Pringle with the platinotype prints, as no print is supposed to be kept under water, much less plunged in a chemical solution.

The gases experimented with were such as are found, under various conditions, existing in minute traces in the air. These are ozone, nitrous fumes, sulphurous acid gas, sulphuretted hydrogen, and ammonia. All of these cannot be present at the same time. Ozone usually is present in small traces in the air in the country, and sometimes nitrous oxide is found. Sulphurous acid is found in towns, and sulphuretted hydrogen seems to be often present in rooms in which coal gas is burnt. The only one of these gases not experimented on was ozone. We mean to expose some of our next batch of prints to its action.

In nitrous fumes the prints fade completely in two or three hours, but this action is retarded by light. The retarding action of light is also especially marked in the case of chlorine, as might be expected. After complete fading in chlorine, it is possible to partially recover a print by exposing it to light.

In the case of the other gases, observations were at first taken from day to day, then from week to week, and they were finally removed and examined after three months' exposure to the action of the gases. The results were as follows:—In sulphuretted hydrogen the paper had turned slightly yellow both in the dark and in the light, but the image was unaffected. This confirms Mr. Pringle's results. In sulphurous acid gas the paper had also turned very slightly yellow, both in dark and light, but the image was unaffected.

Ammonia produced the most marked effect. The paper had turned very yellow both in the light and in the dark, but the effect was more marked in the dark. The print that had been kept in the dark seemed to have slightly faded, though of course it is difficult to be certain of this when the paper has changed in colour. The action of ammonia was rapid, reaching a maximum in about three weeks. After this the prints seemed to be unaffected. A print was also exposed for some time to a current of coal gas (about six weeks) without any deleterious effect.

To sum up the results, they seem to me to be distinctly in favour of the gelatino-bromide print. The destructive action of nitrous fumes was to be expected, but considering that they exist in very small quantities in the air, and considering also that light tends to undo their destructive work, I do not regard this as of much practical importance. On the other hand, the behaviour of the prints in presence of the gases more frequently met with in towns is distinctly in their favour, and if they resist ozone as well, they may be regarded, I believe, as permanent under fair conditions.

Nevertheless, we cannot ever regard silver as being so safe a pigment as carbon or platinum, though of course by this I do not mean so-called carbon prints or platinum prints. Apparently, judging by Mr. Pringle's experiments, we have something else to deal with besides platinum and paper in the platinotype print; and the Autotype Company, using pigments the nature of which is unknown, must expect their prints to be tested as other prints, and cannot shield them behind the well-known permanency of carbon or a pigment. We therefore propose to test some Autotype prints side by side with the gelatino-bromide prints in our next experiments, with a view to checking Mr. Pringle's conclusions as to their permanency.

In conclusion, one curious result is worth again referring to. If, as certainly appeared to be the case, the image fades in ammonia gas, it can hardly be metallic silver, but probably some complex silver compound. This matter, therefore, is especially worthy of more careful experiment.

Notes.

Our Supplement of this week is a representative colour sheet, introduced in illustration of Captain Abney's articles (the first of which appears on p. 178). This colour sheet will, we hope, possess a permanent value as an original upon which experiments in isochromatic photography may be made; precautions having been taken to secure uniformity throughout the whole issue.

A dinner to W. K. Burton is to take place at the Holborn Restaurant on Wednesday next, the 30th instant, at 7 o'clock; and the occasion of it is the departure of Burton to Japan, where he takes a professorship in the University of Tokio. The price of the dinner is 4s. 6d. (not including drinks), and it is expected there will be a large number present. It is, however, desirable that those who intend to come should notify their intention either to J. Traill Taylor, at 2, York Street, Covent Garden, W.C., or to T. Bolas, at 5, Furnival Street, E.C., in order that suitable provision may be made.

The newest thing in photographic literature is the *Allgemeiner Anzeiger für Photographie und verwandte Fächer*, published fortnightly in Dresden. It is a four-page folio, and is circulated gratis to the extent of 3,000 copies, its revenue being derived from advertisements.

We have recently heard of a commercial traveller, also an amateur photographer, who has displayed much ingenuity in getting over the difficulty of changing plates while on his journeys. "You see," he remarks, "I travel a good deal by night, and have adopted the actor's dodge of having a woollen bag, which I get inside, draw up, and tie round the neck. There is nothing half so comfortable to sleep in, because you can lie on the carriage cushions in any position with the certainty of never uncovering your legs, always the drawback of the rug, no matter how tightly you wrap it round you. It occurred to me this bag might be very useful in photography, so I had it covered with Turkey red stuff, and whenever I want to change a plate I get inside—head first this time—tie it round my waist, and do the operation very comfortably. The red bag," he adds, "looks rather horrible in the dead of the night when someone waking up catches sight of me, but it cannot be helped."

Apropos of photography and railway travelling at night, a well-known professional man had, some years ago, an excellent method of beguiling the tedium of the journey, and at the same time exciting the envy of his fellow-passengers. Having a studio at a remote watering place in the South, he used to travel by the night train, previously having taken the precaution to place within a species of Norwegian box, a pint of boiling mock turtle soup. About two o'clock in the morning the passengers would be aroused by a pleasant aroma suggestive of aldermanic banquets, and would wake up to find not that they had been dreaming, but our photographer dispatching the soup, which the Norwegian box had kept quite hot, with much relish. The sight must have been extremely tantalising, and we can imagine the hungry travellers laying down their weary heads again and wishing the soup had existed only in their imagination. To see it literally and smell it actually could only have been exquisite misery.

The usual paragraph as to the photographing of the Oxford and Cambridge crews has made its appearance. The intelligence is as stereotyped as the photographs themselves. It is a singular characteristic of the portraits that the men of any year could very well sit for the men of any other year. The faces are so extremely alike, the resemblance is almost ludicrous. Mr. Galton, perhaps, can tell why. It would be refreshing to see a little change in this perpetual production of monotony, and if the faces cannot be got to vary in any other way, let the crews be photographed the moment after the race, and not a fortnight before it. The elation of the winning crew, and the depression of the losing crew, to say nothing of the exhausted appearance of both, would give a welcome novelty to what are now the most uninteresting photographs published.

And so with foot-ball players. Who cares to see them spick and span, expressionless, and as clean as new pins? Now a photograph of a team after a fray, with jerseys in tatters, with bodies and faces plastered with black mud, with hair dishevelled, and perhaps with a few legs and arms bandaged, would really have a little life and go. As a commercial speculation, we believe such pictures would pay.

Some correspondence has been going on in the New York *Science* relative to stereoscopic vision, and Dr. W. Anderson inquires whether any one has ever tried viewing a stereoscopic picture with the naked eye, and producing the full stereoscopic effect without the assistance of an instrument. Those who had much to do with stereoscopic pictures some five and twenty years ago know well enough that with a little practice this could be done with ease. The faculty was useful in its day, since any one accustomed to the practice could at once detect when, as sometimes happened, there was a mistake in mounting.

The artist who was commissioned by a Birmingham firm to paint a portrait of the Prince of Wales for medallion purposes in connection with the Royal Jubilee should have had some experience in the studio of a Court photographer, and he would then have understood how precious are the moments of Royal personages. The appointment fixed, whatever time Prince or Princess has arranged to give is rigidly adhered to. If the photographer be not ready, or if he fails to make the most of his opportunity, the chance is gone, and rarely occurs again. The artist in question was lucky enough to obtain a sitting from the Prince, and not being satisfied with his sketch, imagined he could easily get a second sitting. He must have been much surprised when he was told that the Prince, however willing he might be, had not a quarter-of-an-hour free for the next six months. But why a sitting from the most photographed man in the world should be necessary is difficult to understand. As the expression of his Royal Highness rarely changes, any artist ought to be able to work easily from photographs.

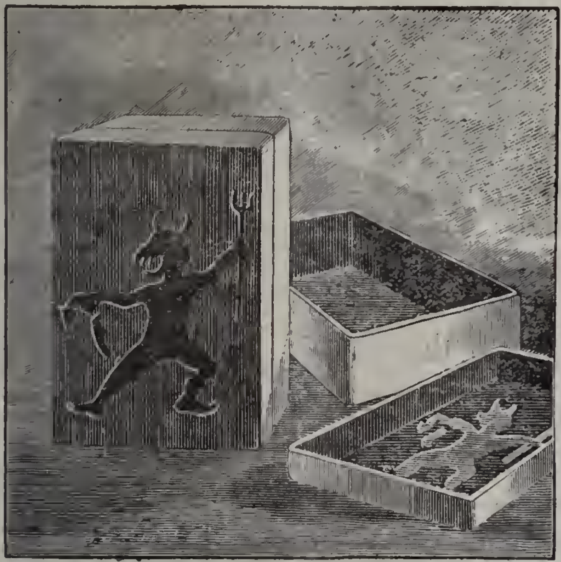
On the 28th of this month opens the Photographic Exhibition of the amalgamated Societies at New York. The three Societies unite in their efforts to make one great exhibition each year, to be held in rotation at New York (Society of Amateur Photographers), Philadelphia (The Photographic Society), and at Boston (The Camera Club).

Judging from some advance sheets of the catalogue and particulars which come to hand through the courtesy of F. C. Beach, we gather that the exhibition of the present year will be a thoroughly representative one, especially as regards the English and other foreign exhibits. The following extract from the preface to catalogue explains itself, and may afford a useful hint to organisers of exhibitions:—"This catalogue is arranged specially for the convenience of visitors and exhibitors. It gives the title of each photograph, the name of the maker, and brief hints as to special points of how the picture was made. Each frame of photographs is numbered; italic letters are arranged in the catalogue, under the address of the exhibitor, in the same relative position as each picture in the frame. Below this arrangement will be found the title of each picture opposite similar italic letters placed in progressive order; the number of each frame is put opposite the name of the exhibitor."

CHEVREUL'S BLACK.

BY T. O'CONNOR SLOANE, PH.D.

The production of absolute black by a pigment or surface colouration has been shown by Chevreul to be an impossibility. No substance is known that does not possess the power of reflecting light to some extent. If paper is blackened, its surface will reflect rays that can act powerfully upon the sensitive plate in a camera, even if the eye, by convention and association, would determine it to be actually black. The same is to be said of black silk and velvet. The latter, more than any other substance, approaches real black. It is an object of common observation that all colours show much more strongly in velvet than in any other material. The reason for this is that, owing to the depth of the pile, the light undergoes multiple reflection. The percentage of white light is diminished with each reflection, and the coloured rays become less and less contaminated with those of other hues. The same reasoning applies to black velvet The light by multiple reflection from its substance is more and more absorbed, and the familiar intense black is the result. A piece of this material placed upon cloth or silk always appears, and is, the blacker. In choosing velvet for such experiments, care must be taken not to use a blue black. The dead black is the proper one to select.



Black, being the absence of colour, is producible by excluding light. The production of the velvet black, we have seen, depends on the mechanical texture of the goods. Nothing is so black as a perfectly dark room. Carrying out these principles, Chevreul devised the wonderfully ingenious way of producing a true black which we illustrate.

He lined the interior of a box with black—pigment, black silk, or black velvet may be used. In the cover of the box he made a hole, not too large, but bearing a certain ratio to the area of the cover. The size should not exceed one-tenth this surface. The spot thus produced reflected no light, as there was no surface. The interior of the box, by colour and shadow, was prevented from reflecting any light, so that absolute blackness resulted. The blackest velvet or silk placed alongside of this spot appears lighter in colour.

In constructing the apparatus illustrated, a famous proverb was selected as a theme, in which a certain personage is stated not to be so black as he is painted. The author of "English as She is Spoke" renders this proverb, "He not so devil as he is black." The blackness of this image is absolute.

A pasteboard box is lined with black silk or velvet, and any desired figure is cut through the cover. This may then be painted as black as possible, or before the figure is cut out, silk or velvet may be pasted over it, and the figure cut through pasteboard and covering together.

Then, on putting the cover in place, holding the box so that a side light will fall upon it, thus preventing direct access of light rays to the interior, the figure will stand out strongly black against a background which, but for the contrast, would itself be pronounced absolutely black.

To apply the most rigorous test, a member of the Society of Amateur Photographers of New York made a photograph of such a box. A carbon B dry plate was used, with thirty-five minutes' exposure, with stop *f*-30. The result was a negative perfectly transparent where the figure came, but strongly affected by the black box cover. Part of the cover was coated with black silk, and part was painted, but both reflected light enough to produce a full photograph upon the plate.

A most interesting application of this principle on the large scale has been made of late years, especially by E. J. Marey, in the photography of moving animals. With Chevreul's black as a screen, a plate can be exposed unaffected by the background, and will reproduce objects moving across the space with perfect fidelity.—*Scientific American.*

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GELATINE FOR COLLOTYPE WORK.

BY A. ALBERT.*

I am of opinion that the idea held by many operators, that it is one and the same whether bichromate of potassium or bichromate of ammonia is used in the preparation of chromated-gelatine for collotype work, the only difference being in the sensitiveness, is entirely erroneous, and I firmly believe that the latter salt is the cause of endless interruptions to the printer, especially in unsettled weather.

I take the liberty of bringing before your notice my experience, and the results of my private researches on the effects produced by both of these salts in the collotype process, as well as their behaviour in conjunction with different sorts of gelatines.

To 1,000 grammes of water I add ten drops of a saturated sol. of chrome alum. This mixture, upon being shaken up after it has stood for a quarter of an hour, must have an opalescent appearance, with a slight milkiness or turbidity; too much chrome alum imparts a green colour to the water. I now add the gelatine, and keep it at a temperature of 45° R. for 15 mins.; afterwards I add the salts of chromium, stirring all the while, and raise the temperature of the water-bath to 52—56 R., filter, and keep in wide-mouthed bottles for use. The jelly thus prepared must be kept at least ten hours in a solidified state previous to using. The temperature and time must be strictly adhered to.

Hard Gelatine.—Plates prepared with this have a shiny transparent coating, more or less according to the circumstances. Such plates give hard prints, and are very soon "printed out," as the finest, and even the middle-tints become weaker, and the shadows gradually coalesce, especially if the exposure was short, or the negative very dense, and they are generally useless after a few impressions have been pulled. If bichromate of ammonium is used in conjunction with a hard gelatine, then, as a general rule, it is impossible to obtain more than one or two prints from each plate.

Soft Gelatine.—If this is employed with bichromate of potassium, then the plates will have a dull but rough and non-transparent coating, which will be found very unserviceable for printing, as the prints will lack vigour; the high lights will tone, and the whole picture appear blurred. If bichromate of ammonia instead of potassium is used, the prepared plates will also have a dull appearance, but will not be of sufficient durability, the finest tones very soon disappearing during printing.

Therefore neither hard nor soft gelatines are suitable for collotype work, as the printing operations are rendered more difficult. If both sorts are mixed, then something near the right article is obtained; at the same time, one is not sure of the results being anything like those produceable with middling hard gelatine, which must be accepted as the most suitable kind for collotype printing.

Middling hard gelatine from the manufactory of F. Creutz, in Michaelstadt, Hesse, absorbs five times its own weight of water at 15° R., without signs even of disintegration after a sojourn therein for thirty-six hours. Plates prepared with it and chemically pure bichromate of potassium have a beautiful matted or dull surface, from which long numbers can be printed without any falling off of the high tint. If the printer is the leastways careful, even the details in the shadows will be maintained to the last if the negative was a good one and the exposure rightly estimated. This chromated gelatine requires a very small amount of re-damping. As a general rule, short exposures and hard negatives are synonymous with repeated dampings. It faithfully reproduces the character of the negative, and the jelly can be used after it has stood for upwards of four days. Should the work in hand require a harder chromated gelatine, as in the case of reproductions of black and white, then the addition of a small quantity of bichromate of potassium will have the desired effect. In some cases equal quantities of potassium and ammonium salts.

The grain of the plate depends entirely upon the consistency and quantity of chromated gelatine used.* To test the suitability of gelatine for collotype work, make up two small portions of the gelatine to be tested, adding bichromate of potassium c.p. to the one, and bichromate of ammonia to the other, and prepare a plate with each solution. If both plates have a dull, semi-opaque surface, that is a sure sign of a soft gelatine; on the contrary, if both plates appear glossy and pellucid, then the sample is hard. Should it, however, be middling hard, then the dried coating prepared with potassium will be dull, but not rough; that with ammonia transparent and shiny.

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* Delivered before the Vienna Photographic Society.

To connect several negative, or parts of negatives, together, coat a sheet of plate glass with a 1½ to 2 per cent. normal collodion, and when dry pour on a sufficient quantity of the ordinary gelatine solution used for stripping. When required, take the dried plate and soak it face upwards in cold water; on removal therefrom dry the surface with a soft cloth, and lay it on a sheet of white paper upon which the necessary divisions have been previously marked out; now take the stripped negatives and press them (gelatine side undermost) on to the wet surface, using a soft cloth to expel air-bells. When dry, do all necessary retouching with red oxide of iron, and after that is thoroughly dry, strip the gelatine, together with the negatives, from the glass.

With regard to the preliminary coating, O. Pustet says that with a little practice it is possible to judge whether the silicate-albumen coating will be good or not, during the act of pouring it on the plate. A pretty sure sign of the suitability of a silicate-albumen preliminary coating is, that after desiccation on the glass it is hardly perceptible; heated to a temperature of 40 to 50 deg. R., in the drying cupboard—which, by all means, should always take place—the coating appears perfectly even and like very transparent opal; after rinsing in water and again drying spontaneously, it should reflect the colours of the spectrum.

Patent Intelligence.

Applications for Letters Patent.

3922. John Rudolph Gotz, 433, Strand, for "Improvements in instantaneous shutters."—15th March, 1887.

4178. Thomas William Nagington and William Hugh Waring, 70, Chancery Lane, London, for "An improved construction of rotary album suitable for photographs, memoranda, and the like."—Complete specification.—19th March, 1887.

4202. George Frederick Blackmore, 1, Coulter Road, The Grove, Hammersmith, W., for "Improvements in washing and draining racks for photographic negatives, &c."—21st March, 1887.

Official Abstract of Accepted Complete Specifications.

Newman, 7156, 1886. "Controlling length of exposure by connecting shutter to piston fitted in cylinder with regulated air openings."

Specifications Published.

5205. Edward William Foxlee, 22, Goldsmith Road, Acton, W., Middlesex, photographer, for "An improved method of producing printing surfaces by photography."—Dated April 14th, 1886.

My invention relates to that method of producing photographically engraved plates for intaglio printing known as the "Waterhouse Process." This process is described in the *British Journal of Photography*, and in the *Photographic News* for November 26th, 1880. Briefly it consists in producing a photographic image in gelatine on a silvered copper plate after the manner of carbon printing. Then, while the gelatine is still wet, it is dusted over with powdered glass, sand, emery, or other gritty material, which has previously been treated with wax, stearine, or other similar substance. After the gelatine is dry, the gritty particles, which have imbedded themselves in it, are removed by brushing, or other mechanical means. The grained image thus obtained is then treated with plumbago, and an electrotype made from it. This electrotype forms the printing plate from which impressions are obtained in the copperplate press. In practice it is found very difficult to remove the gritty matter without injuring the delicacy and sharpness of grain it has produced, and it is the crispness of this grain that gives the ink-holding property to the finished plate. Further, if any of the gritty particles remain in the gelatine, they destroy the evenness of the grain and interfere with the deposition of the copper in the electrotyping operation.

My invention consist of substituting for the powdered glass, sand, emery, or similar materials, which have to be removed mechanically, powdered resins, resinous gums, asphaltum, and analogous substances which are insoluble in water, but soluble in suitable menstruums such as alcohol, ether, benzol, naphtha, turpentine, mineral oils, &c., according to the resins or resinous gums employed. In my improved method the grain-producing material is removed from the gelatine film by solution instead of by mechanical means, so that risk of injury to the grain by abrasion is avoided.

My invention is carried out as follows. An image in pigmented gelatine, from a photographic negative, is developed upon a copper plate, either silvered or otherwise, by the usual process of carbon printing. After the print so obtained has drained, I sift over it a resin or resinous gum in a more or less fine state of division, according to the grain required, and then allow it to dry. The gelatine image may next be rendered insoluble by immersing it in a solution of alum, sulphate of alumina, or their analogues, and again dried, or the gelatine may be made insoluble by treating it while still wet, and before applying the grain-forming material, with one of the alkaline bichromates, and, after drying, exposing it to the action of light. When the gelatine has been made insoluble the plate is immersed in a solvent of the resin or resinous gum employed. Thus, if sandarac be used, then I prefer alcohol as a solvent; if dammar or bitumen, benzol, and other resins or resinous gums, according to their solvents. After the resin has been dissolved the plate is further rinsed with the solvent and dried. The gelatine is then coated with plumbago, and electrotyped in the ordinary manner.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—The use of resins, resinous gums, bitumen, and similar substances, which are insoluble in water, for producing a grain on the gelatine image, and afterwards removing them by solution, substantially as described, in place of the sand or other gritty matter, hitherto used, and which has to be removed mechanically.

5636. Charles Pumphrey, of Regent Works, Herbert Road, Small Heath, Birmingham, Manufacturer, "for "Improvements in the use of partial ball-and-socket joints for the adjustment of photographic cameras on their legs or stands."—Dated April 24th, 1886.

The claims:—

1. The plan of using a hollow cup of the form of part of a hollow sphere, and grasping it between the inner and outer surfaces.

2. The use of such forms of annular or partial sockets as I have described or drawn, to grasp a sphere which is attached to either a camera, or in any position to the head of the stand.

6013. Vero Charles Driffield, Mount Pleasant, Appleton, Widnes, in the county of Lancaster, Engineer, "An improvement in photographic cameras."—Dated May 4th, 1866. Claims the reflecting arrangement to the focusser of a double detective camera.

789. Warren Highlmen Boles, residing at Syracuse, in the county of Onondago and State of New York, one of the United States of America, manufacturer, for "Improvements in photographic burnishers."—Dated 18th January, 1887.

A burnisher already described in the Photographic News.

16,605. Henry Coppin, of 39, Wood Street, in the City of London, Necktie and Cravat Manufacturer, for "Improvements in photographic carriers and apparatus relating thereto."—Dated 17th December, 1886.

An arrangement for using a light-tight bag in conjunction with a special plate-carrier.

Patents Granted in America.

356,941. Oliver Hyde, Vallejo, Cal. "Photographic camera."—Filed May 1st, 1886. (No model.)

Claim.—1. A photographic camera comprising an inclosing case having parallel partitions forming three compartments, one above the other, the upper compartment containing a magazine of sensitive plates, a rack, and a gear engaging the rack by which the magazine is advanced so as to deliver the plates, a central compartment containing the lens and focusing mechanism, and a receiver in the lower compartment, into which the plates are discharged after having been exposed.

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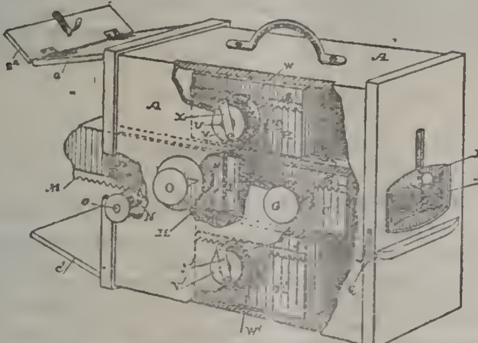
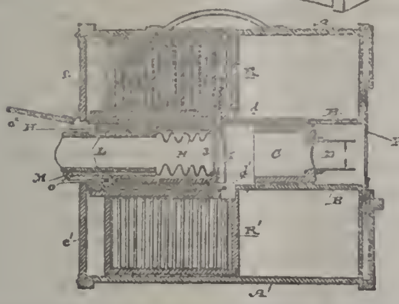
* 1 part of gelatine to 15 of water; 2 c.c., of which solution is used to each square decimeter of surface is a general proportion.

2. The upper compartment having a magazine provided with a sliding cover, in combination with a rack, pinion, and knob by which this magazine may be advanced while its sliding cover remains stationary.





3. The upper compartment, containing the sliding magazine with its rack and an actuating pinion, the lower compartment, containing a similarly-shaped receiver, into which plates may be delivered, and a central compartment containing the lens at its front, in combination with a movable case at the rear of the central compartment, having the translucent plate fixed to its front, and guides for receiving the plate from the magazine and transferring it after having been exposed to the receiver below.

4. The movable box or case H within the central compartment of the case, having the plate-holder guides and the translucent focusing-plate fixed to its front end, in combination with a cam and knob by which the box may be moved forward or backward, so as to bring the focusing-plate or the guides beneath the slot *d* in the upper diaphragm of the case.

5. The case or box H, having a focusing-plate and guides or plate-holders fixed to its front end, and a cam by which it may be moved forward or back, in combination with an interior bellows and hood, racks and pinions by which the bellows may be extended or closed up within the case.

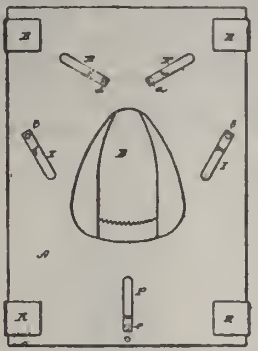
6. The compartment-case having a plate-magazine in the upper compartment, a lens and focusing mechanism in the central compartment, a plate receiver in the lower compartment, transverse slots in the horizontal partitions through which the plates may be delivered successively from the magazine to the central compartment and thence to the receiver below, and racks and pinions by which the plate-magazine and receiver may be advanced, in combination with fixed circular racks and spring-pawls connected with the knobs and pinions, whereby the magazine and receiver may be advanced accurately.

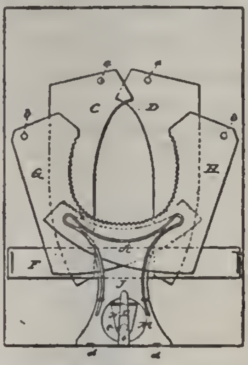
357,886. Leo. F. Adt, Waterbury, Conn., for "Vignette attachment for photographic frames." Filed Aug. 16, 1886. Serial No. 210,992. (No model).

Claim.—1. In a vignette attachment for photographic printing, a cover A, adapted to be placed upon the printing-frame and having an opening B, combined with the plates C D, hung upon a pivot near one end of the opening and extending therefrom, one each side the opening, so as to swing in a plane parallel with the plane of the cover, substantially as described.

2. The combination of the cover A, having an opening, B, therein, the plates C D, hung to the cover near one end of the opening and extending from the pivots, one each side the opening, adjustable in a plane parallel with the plane of the cover, and a handle E, fixed to the pivots of the said plates upon the opposite of the cover, substantially as described.

3. The combination of the cover A, having an opening B therein, plates G H, one hung to the cover each side of said opening upon a pivot *b*, the said plates extending from the pivots below the opening and so as to swing in a plane parallel with the plane of the cover, the inner edge of the said plates segment-shaped, the said plates made adjustable toward or from each other, and so as to contract the said opening at one end, substantially as described.





4. The combination of the cover A, having an opening, B, therein, plates G H, one hung to the cover each side of said opening upon a pivot *b*, the said plates extending from the pivots below the opening, and so as to swing in a plane parallel with the plane of the cover, the inner edge of the said plates segment-shaped, the said plates made adjustable toward or from each other and so as to contract the said opening at one end, with mechanism, substantially such as described, to adjust the free end of said plates toward or from the cover, substantially as described.

5. The combination of the cover A, having an opening B therein, the plates G H, hung one each side the said opening and so as to swing in a plane parallel with the plane of the cover, the said plates extending from their pivots toward one end of the opening, the inner edge of the said plates of segment shape, and the said plates adjustable toward or from each other, a plate J, hinged to the cover and extending between the said plates G H and the cover, with a cam arranged to act upon said plate to turn it toward or from the cover and correspondingly adjust the said plates G H, substantially as described.

6. The combination of the cover A, having an opening B therein, the two plates G H, hung to the cover upon opposite sides of said opening and arranged to swing in a plane parallel with the plane of the cover, their inner edge of segment shape, with a handle I, fixed to the pivot of each plate upon the opposite side of the cover, substantially as and for the purpose described.

7. The combination of the cover A, the plates C D and G H, each hung to the cover so as to swing in a plane parallel with the plane of the cover, the said plates C D extending one each side the opening, and the plates G H also extending in the same direction, but of segment shape upon their inner edge, the plate J hinged to the cover and extending between the said plate G H and the cover, so as to bear upon said plates G H a spring K on said plate, arranged to bear upon the reverse side of said plates G H, so as to grasp said plates G H between said spring K and plate J, with mechanism, substantially such as described, to adjust the said plate J, substantially as and for the purpose specified.

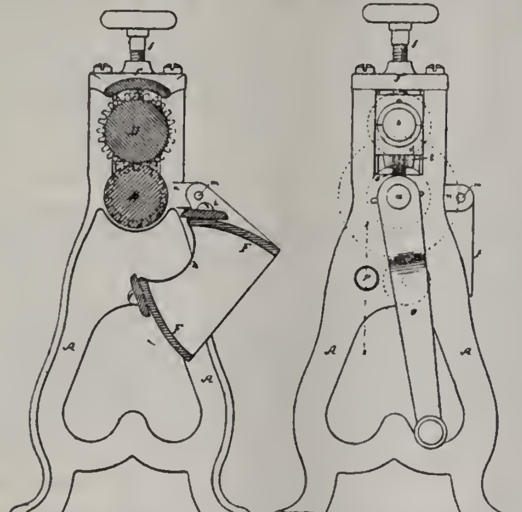
8. The combination of the cover A, having an opening B therein, and with plates hung to said cover to swing in a plane parallel therewith, whereby the size of said opening may be adjusted, a photographic-printing frame having grooves *f* formed therein, U-shaped spring-clasps R, one leg adapted to enter the grooves in the frame, and the other to embrace the cover to secure the two together, substantially as described.

9. In a photographic-printing frame, the combination of the cover A, having an opening B therein, plates pivoted to the under side of said cover at a point above the bottom of the opening, and so as to swing in a plane parallel with the plane of said cover, the free ends of said plates extending below the bottom of the opening in the cover, the said plates by their swinging movement adapted to adjust the extent of the lower portion of

the opening in the cover, and with mechanism, substantially such as described, to depress the free ends of the said adjustable plates to a greater or less extent from said cover, substantially as and for the purpose described.

10. In a vignette attachment for photographic printing, a cover adapted to be placed upon the printing-frame, a plate across the bottom or lower end of the opening upon the under side of said cover, the said plate adjustable up and down from said cover, and with relation to said opening with mechanism for so adjusting said plate, substantially as described.

357,954. William G. Entrekin, Philadelphia Pa. "Photographic burnishing-machine." Filed May 14, 1886. Serial No. 202,160, (No model.)



Claim.—1. The combination of the frame of a burnisher, the lower roll having fixed bearings, the upper roll having its bearings in adjustable boxes, and lifting-springs adapted to sockets which inclose and protect said springs when the upper roll is depressed, the casings of said sockets being of less external diameter than the width of the upper boxes, whereby a circulation of air around said casings is permitted, all substantially as specified.

2. The combination of the frame of the burnisher, the lower roll adapted to fixed bearings, the upper roll, and adjustable journal-boxes, the lifting-springs and spring-receiving sockets serving as stops, whereby the depression of the upper roll is arrested before said roll comes into contact with the lower roll, all substantially as specified.

3. The combination of the burnisher-frame, and its upper and lower rolls with the hood F, partially embracing the lower roll, and pivoted to the frame at one side of said lower roll, whereby said hood can be swung laterally, so as to wholly expose the lower roll, all substantially as specified.

358,774. Jean Baptiste Germeuil-Bonnaud, Longton, County of Stafford, England, for a "Process of producing copies for lithography from phorographs." Filed Jan. 15, 1887. Serial No. 224,493. (No specimens.) Patented in France Aug. 28, 1885, No. 170,889; in England Nov. 9, 1885, No. 13,609, and in Germany, Nov. 13, 1885, No. 35,434.

Claim.—1. The method herein described of producing a copy of a photograph or drawing upon a lithographic stone or plate by first forming on the photograph or drawing a coating having a grain produced artificially thereon, then tracing upon the said coating with lithographic ink a copy of the photograph or design, and, lastly, transferring such design to a smooth stone or plate, substantially as described.

2. In the process of transferring a photograph or drawing on to a lithographic stone or plate, the improvement consisting in producing a grained surface upon the photograph or drawing by the application thereto of a compound containing kaolin, substantially as and for the purposes herein described.

3. In the process of transferring a photograph or drawing on to a lithographic stone or plate, the improvement consisting in producing a grained surface upon the photograph or drawing by applying thereto a coating which is then pressed upon a grained stone or plate, so as to have the grain thereof imparted to it, substantially as described.

4. The method herein described of transferring to a lithographic stone or plate a design produced by drawing with lithographic ink on a photograph or drawing coated with a gelatinous composition, by moistening the photograph or drawing, and also moistening and heating the stone or plate, then applying the former to the latter under pressure, and, after pouring boiling water on the photograph or drawing, removing the same, leaving the design on the stone or plate, substantially as described.

Correspondence.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—Mutual regrets that one's opponent does not confine himself to facts become puerile, and as no statement that I have made in this discussion has been, or I submit can be, shown to be otherwise than in strict accordance with fact, I am quite willing to leave this branch of the controversy to the judgment of those who may have studied the question optically and mathematically.

Mr. Dallmeyer now says, that in the case of the three lenses that I instanced, I merely give the means of obtaining the "diameter of the aperture which *they should have* in order to mark the first stop 1 by the Photographic Society's Standard." In reply, I did not suggest that the lenses referred to *should have* that, or any other particular aperture; and if, as in the case of the lens he puts forward as a difficulty, one of 14 inch focus and 2 inch aperture, the aperture is less than unity of the standard, the full opening would, equally with Mr. Dallmeyer's and with the Society's standard, bear a number corresponding with its rapidity in comparison with the standard, that is to say, in relation to $\frac{f}{1\cdot3206\text{c.},}$ or $\frac{f}{3}$.

Mr. Dallmeyer next puts it that the comparison as to simplicity should be made as between 16 and 10, and asks which is the simpler. Now, although the areas of the stops are as the squares 16 and 10, the diameters are as the roots 4 and 3·126 &c., and *it is the diameters of the stops by which we take our measure.* Which division is the simpler?

Mr. Dallmeyer proposes "to make the matter perfectly intelligible" by giving two examples. In his first example he takes three lenses of 6½, 11, and 17 inch focus, and then, skipping the necessary processes of measuring the diameter of the aperture, and dividing the focus by that measure, he assumes intensities represented by whole numbers and of convenient ratio to make his proposed standard appear to be the simpler. In fact, however, the actual intensity will commonly have to be represented by a fraction, and looking over his table of sixty lenses, I do not find *one* corresponding to the intensity $\frac{f}{5}$, that which he has put forward as requiring so much more complex figures by the P.S. standard than by his own. As I stated in my first letter, stops cut to give simple numbers by one standard give complex ones with another.

Mr. Dallmeyer's next example is that of a lens of 14 inch focus and 2 inch aperture. To be theoretically perfect, make the aperture larger by so small an amount as the $\frac{1}{250}$th part. The aperture will then be numbered 3 on the established standard, and the other stops will bear the numbers 6, 12, 24, and 48. If this should in any case be impracticable, the trifling variation of size between the exact two inches and that of strict theoretical requirement would be quite beyond detection in the exposure. Mr. Dallmeyer in his table only speaks of "approximate" intensity ratio.

Mr. Dallmeyer says that he is personally prepared to prove that there are more than four times as many lenses of $\frac{f}{3}$ intensity in use as of $\frac{f}{4}$. It is difficult to see how he can prove anything beyond the manufacture of his own firm, and I am still of opinion that there have been many times more $\frac{f}{3}$ lenses manufactured than $\frac{f}{4}$. If I say t times as many I believe I shall be considerably with the mark.

Mr. Dallmeyer says that a sentence of mine, which he quotes, sufficed for him to arrive at a certain conclusion. If this were so it would not suffice to justify him in saying as he did, that I had made a statement which, in point of fact, I had not made. W. E. Debenham.

THE EASTMAN STRIPPING FILMS.

Sir,—Owing to the very short time the Eastman stripping films have been before the general public there remains considerable uncertainty about them, and, therefore, the results of twelve months' experience may be of some value to those who are considering the advisability of taking to roll-holder and films.

One of the supposed drawbacks to the films was the fear that in course of time the insoluble coating would affect the soluble substratum and prevent stripping, and this fear on the part of the makers delayed the issue of the films for nearly twelve months.

Exactly twelve months ago I received five spools of strippers (10 by 8), and the ease of carriage caused them to be subjected to many hundred miles' travel, for wherever I went they went, in the hope of something photographic turning up.

Last August found me in Devonshire, and then I exposed the last of my spools. On developing there were one or two negatives which I thought not worth keeping, and they were about to be consigned to my waste basket, when the thought struck me that I might keep them for six months, and then try to test the truth of the statement that "films would not strip after being developed and dried," and I have now the great satisfaction of saying that on Saturday last—six months after development and drying—I stripped them without difficulty, the paper backing coming off as freely as those freshly developed.

This, I think, is most important information for the tourist photographer, who may, from time to time, desire to test his exposures, and yet be afraid to do so lest he lose a good picture through not stripping at once. He can now, with all confidence, develop when he likes, and strip when he comes home.—Yours faithfully,

Wm. H. Hyslop.

City Liberal Club, Walbrook, E.C., 22nd March.

Proceedings of Societies.

Photographic Society of Great Britain.

A meeting was held in the Gallery, 5a, Pall Mall East, on Tuesday last, the 23rd inst., W. England in the chair.

The Chairman announced the farewell dinner to be given to W. K. Burton at the Holborn Restaurant, on Wednesday, the 30th inst.; dinner 4s. 6d., not including wine.

J. R. Gotz exhibited a camera of his own designing.

Discussion on bromide prints.

R. L. Kidd showed some prints, and was understood to say that they were some of the earliest productions, probably those made by Maudsley, about 1876, but as the meeting was conversational rather than formal, it was not possible to follow all that was said.

W. Bedford exposed a blocked-out print from October 18 last to present time. There was no fading, but a slight darkening of the paper.

H. .J Burton read a letter from John Macmahon, who, in spite of the learned theories to the effect that bromide prints cannot and do not fade, had found that a bromide enlargement he had sent to a customer had almost gone in about a year, leaving a sickly yellow tint, except where an artist had done work of the nature of retouching. This fading only took place where the print was exposed to light, the portion of the print covered by the mount being in good preservation.

F. Ince had found that, when a print containing acid is immersed in the hypo bath, fading is the result.

Several firms exhibited their wares in the bromide print line.

The discussion then drifted off on the subject of film negatives.

W. E. Debenham compared the tone of bromide prints with that of platinum prints, and not to the disadvantage of the former.

A. Spiller said the great pull of the bromide process over the platinotype is that in the case of a weak or indifferent negative you may get a good print; but you cannot get a decent platinotype from a weak or bad negative.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 17th inst., W. H. Prestwich in the chair.

The subject of photographing snow scenes was brought under notice by L. Medland, who spoke of and illustrated the advantage to be derived from a full exposure, as regards detail and harmony. In this case twelve seconds $\frac{f}{64}$ in midday sunlight was the exposure given on a plate registering 22° Warnerke.

Orthochromatic plates were then discussed. J. R. Gotz spoke of the keeping qualities of azalin prepared plates, and of the circumstance that he is making further experiments in that direction. The Chairman, Alex. Mackie, A. L. Henderson, W. B. B. Wellington, and others also took part.

J. Traill Taylor handed round a copy of Bigelow's "Album of Posing and Lighting," illustrated with silver prints, published in 1876, in which there appeared to be no deterioration of the prints. He then referred to the loss the Society was about to sustain by the departure of W. K. Burton, who has lately received an important appointment under the Japanese Government. Mr. Taylor said he felt regret tempered with the pleasure derived from the knowledge that as the professor in a newly-created chair of the Science College Mr. Burton would shine.

The Chairman, Hon. Secretary, and others, spoke in a similar strain, and it was unanimously resolved to elect Mr. Burton an honorary and corresponding member of the Society.

W. K. Burton thanked the meeting for the terms in which his name had been mentioned, and for the honour extended him. He assured the members that leaving his large circle of friends in the various metropolitan photographic societies, and this Society in particular, had depressed his spirits very much.

It was subsequently announced by Mr. Taylor that arrangements are in progress to entertain Mr. Burton at a farewell dinner.

A. Mackie said an authority lately recommended dipping gelatine stripping films in a solution composed of one part of glycerine to twenty of water, which enabled the films to be stripped with great ease. This led to a discussion upon the action of glycerine with gelatine, and it was resolved to invite the author of the suggestion above referred to (F. G. B. Wollaston) to give a demonstration of film photographic manipulation at an early date.

A. L. Henderson stated that a lecture on lenses would be given by J. Traill Taylor before the Bolton Society on April 1st. Tickets of admission could be obtained upon application.

On Thursday next, the 31st inst., a demonstration on Film-Photography will be given by S. G. Buchanan Wollaston.

Sheffield Photographic Society.

An ordinary meeting was held in the Society's Room, March 4th; T. S. Yeomans, President, occupied the chair. C. F. Coombe, M.R.C.S., was elected a member. Arrangements for the summer excursion were made; also subjects for members' competition. The Chairman kindly offered a special prize. The conversazione which took place on Wednesday evening last was well attended. The photographs exhibited there were almost wholly the work of the members, including the best pictures of last year. Amongst contributors, J. W. Charlsworth, a frame which was awarded the Society silver medal 1886; F. Turner, his medal series; Jonathan Taylor, artistic views in Derbyshire; E. H. Peace, local and other well-selected pictures; C. Yeomans, excellent platinotypes; W. Gilly, Jun., good views taken at Stratford-on-Avon, and interesting local; W. B. Hatfield, home portraiture and pleasing lane scenes: Dr. Morton, several photographs of historical interest. The apparatus.—A large collection of photographic requirements by Messrs. Cubley and Preston. Mr. Hilbert had also a fine display; and John Taylor, his camera and stand with all latest modifications; F. Barber, an etho-oxygen light apparatus; T. Atkin, microscopic and photo-micro; S. Bromley, stereoscopic views, which were much admired; also about a dozen transparencies made by the late Mr. Breare, lent by Dr. Bartolome. T. Charlesworth exhibited his micro-photo apparatus, and demonstrated process. Some relics of the past in examples of old cameras lent by Dr. Morton and S. Bromley, the latter showing some capital Daguerreotypes. A lantern entertainment, under the management of C. Yeomans, who used his own pair lantern and electric incandescent light from ·32 cell battery. About 150 slides, mostly made by members, were ably projected upon the screen.

NORTH SURREY PHOTOGRAPHIC SOCIETY.

THIS Society held its usual fortnigthly meeting at the Greyhound Hotel, Dulwich, on March 16th, BROMLEY SMITH occupying the chair.

Mr. RYDER read a communication on "Bromide Paper," in which he advocated the following modification of the formula published for use with the Eastman paper, viz., the oxalate to be increased to nine parts to each part of iron, and the bromide to be reduced to half the quantity stated.

H. SENIER (Hon. Sec.) gave a description of a series of experiments he had recently made with a view to obtaining a variety of tones in bromide prints and enlargements. He first converts the silver of a bromide picture into chloride by bleaching in chlorine water, after which he re-develops with ferrous-oxalate, or pyro; a variety of shades of red and brown can be then easily obtained by the use of bromide of potassium in the developer in greatly increased quantities, as much as twenty grains per ounce being used for warm red tones. A notable fact in connection with this process is that the re-development must be conducted in actinic light, otherwise no re-development is possible. Bromide prints which have been spoiled by over-exposure can be made into good prints by this method, as the re-development can be stopped at any stage, a fact which is important when working large sheets of paper.

Another method of producing pleasing tones in bromide prints was suggested by Mr. Senier. The print is immersed in chlorine water, and partially bleached until a thin layer of chloride of silver is formed. This is easily recognized by a milky appearance being seen on the surface of the picture. The print is then washed, and exposed in a strong light until the chloride of silver is reduced to a warm tint. Specimen prints illustrating each of these experiments were exhibited.

Mr. Walff submitted for inspection some chronographs for tinting exposures.

The next meeting will be held on March 30th, when J. Thomson, author of "China and its People," has consented to deliver a lecture on "Travels in China with the Camera."

CAMERA CLUB.

ON Thursday, March 17, H. J. GIFFORD gave a demonstration and explanation of his method of making collodio-bromide emulsion and coating of lantern plates therewith. H. H. O'FARRELL occupied the chair.

Previous to the address the CHAIRMAN drew attention to the projected excursion of membersand friends, arranged for April 16, to the Hayes and West Wickham district.

Mr. DAVIDSON made some remarks upon an interesting set of prints which were mounted upon one of the Club screens. These were prints from negatives of fireworks and illuminations at a Calcutta Jubilee celebration, taken by Major Waterhouse upon plates that he had treated orthochromatically, and were specially interesting coming from such a source.

Mr. GIFFORD went through his demonstration, and explained upon the blackboard how he arrived at his formula. An adjournment was then made to the dark room, and some plates were coated, and others previously prepared exposed and developed.

In the discussion which followed, J. KING said that to obtain clear glass he had at times thought that a somewhat rapid development should be given. If kept long under development or with any forcing the plate was clouded. This, he thought, was staining. He had noticed that some gave clear glass, others from the same batch, under exactly the same treatment, showed stains, and if proceeded with further gave dichroic fog.

In answer to a question whether paper could be coated with collodio-bromide emulsion, Messrs. GIFFORD and KING gave affirmative replies.

The discussion was continued by Messrs. ATKINSON, DAVISON, and GALE, and in conclusion the CHAIRMAN remarked upon the interest this subject should have. It was hardly to be expected that collodion plates were coming in again, but still it was seen that Mr. J. B. B. Wellington had made some orthochromatic collodio-bromide plates very rapid, and it was possible that we might return to the old collodion film, which certainly contained some advantages over gelatino-bromide.

On Thursday, March 31, an exceptionally interesting lantern slide exhibition has been arranged. Slides will be shown or sent by F. Dunsterville, C. B. Wright, Frift, and Gale.

Dr. Johnson will exhibit some microscopical slides with a new arrangement, and Frank Howard will exhibit slides and make some remarks specially in regard to printing-in of clouds. The exhibition will commence at eight p.m.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the meeting held at Myddelton Hall, Islington, N., on Tuesday, March 15, J. TRAILL TAYLOR, President, in the chair,

F. W. HART was elected an honorary member.

A question from the box was read, asking whether a mixture sold as fifteen grains of chloride of gold and sodium, seven and a half grains being pure chloride of gold, was the same preparation as that usually labelled fifteen grains of chloride of gold, seven and a half grains being pure metal.

F. W. HART said that such tubes should contain seven and a half grains of metallic gold, but that sometimes fifteen grains of the mixed chlorides contained eight or eight and a half grains, while if weighed in a moist atmosphere enough water would be absorbed to reduce the amount of metal to seven grains.

L. MEDLAND asked the experience of members in photographing snow scenes.

The CHAIRMAN said that to get the best effects a full exposure was necessary. A small stop should be used, and the exposure prolonged so that detail in the shadows was fully developed before the snow-covered portions became too dense. He then called upon E. Clifton to read his paper on "Cameras, Ancient and Modern" (see page 181). The paper, which was illustrated by blackboard diagrams, having been read,

The CHAIRMAN said that among the cameras of a former period there was one of which no notice had been taken in the very comprehensive paper just read: he referred to the panoramic camera of Sutton, and which was of a typical character. As some of them doubtless were aware, the picture was received on a long cylindrical plate, every portion of which was in focus. He then described by what means he (the speaker) adapted the camaera for using a long strip of sensitised paper, which, being pressed against the cylindrical glass, was kept in proper shape. To the dark slide he had adapted a roller at each end on which to wind and unwind the paper. He had also employed with it an ordinary lens instead of the spherical lens of Sutton. Concerning double dark slides, he spoke approvingly of a system much employed in America, although of English inception; this slide permitted two plates to be inserted in a groove at the end, the plates then being kept in position by a wooden or other opaque slide going between them, and by which all light was debarred access to the plates. Other desirable features in American cameras and slides were alluded to, more especially the manner in which the wooden square carrying the lens was stepped into a recess in the camera front instead of being slidden, and the complete withdrawal of the shutter from the dark slide while making an exposure. He endorsed all that had been said about Mr. McKellen, of Manchester, of one of whose latest productions—a 10 by eight—he was proud to be the owner, as in it was embodied all those features he considered necessary or desirable in a camera, especially for outdoor work. He could not conclude without a word of recognition of the ingenuity of C. G. H. Kinnear, of Edinburgh, who was the originator of the type of camera with the conical bellows and sliding baseboard.

L. MEDLAND said that he had been using Shew's adapter with his camera, and had found it very useful.

F. W. COX asked if there was any advantage in having a side swing fitted to the front as well as the back of a camera.

E. CLIFTON thought not; in fact, the side swing was seldom required at all, and called for much judgment on the part of the operator when it was used.

F. W. HART said that Mr. Clifton had described an universal plate holder for the dark slide. He had many years ago made such a contrivance to take plates from 30 by 24 downwards of any shape or size. Mr. Clifton had mentioned Mr. Harrison's name in connection with his little metal camera, but had not touched on his share in perfecting the pantoscopic camera patented by Mr. Johnson.

Mr. Fuller exhibited an Ashford's camera stand capable of supporting a 12 by 10 camera.

Mr. Hart exhibited and fully explained a very perfect whole-plate camera with a jointed baseboard giving a range of focus from three to forty-four inches; only so much of the baseboard as was in use need be attached to the body. It could be used for copying general studio and landscape work, and possessed every possible adjustment.

The next meeting will be a technical one, and will be held on Tuesday, April 5.

Manchester Photographic Society.

The usual monthly meeting of the Lantern Section was held on February 23, John Schofield in the chair.

The Chairman said the first business was a discussion upon the comparative results of gas in high-pressure bottles and gas in bags. Personally, he was not at all satisfied with the performance of gas bottles as used at the last meeting. The light from them was certainly very intense, and probably necessary when you had large discs and great length of room to contend with, but which you did not meet with in ordinary lantern work; but, in a moderate room, he believed them to be useless. It was, he thought, quite possible to have too much light, for, beyond a certain power, it was wasted. He found that if in ordinary daylight we could get a disc of ten feet with a "blow-through" jet thirty feet off which was just visible, that was sufficient for most purposes, and if you got a light more intense than that, you would get something that was not natural, and which would expose the defects of the slides. On the other hand, gas bags would give all that was required from forty to sixty feet with mixed jets. The objection to bags was that they were too bulky; but they were, in his opinion, the best arrangement we have at present.

W. I. Chadwick said the question was, were the bottles a success at the last meeting? He thought not. He said whether we use gas from bottles or bags, if it came out at the same pressure, the light would be the same. Higher pressures, with suitable limes and jets, gave a more powerful light, and he admitted the light was at the last meeting brighter when the bottles were used than when the bags were substituted; but the bags had not fair play. He was quite in favour of any arrangement which would be more portable and convenient than gas bags, and gave a description of some of the methods he had seen in use in America, and thought, for amateurs, the arrangement of George Prouse, of Montreal, was very good—viz., filling a cylinder of about three feet cubic capacity by means of water pressure, which was in Manchester from sixty to seventy pounds in many places. He also described an arrangement used by many Americans, where the retort was also a holder, and the gas generated in a strong retort of about a cubic foot capacity to a given pressure. He had seen a most successful exhibition conducted by this arrangement—viz., using the gas straight from this retort and holder combined.

J. G. Jones said the reason why he had gone in for bottles was size of disc, distance, and portability. With the bottles you got greater pressure than with the bags. He considered it unsafe to use more than three fifty-sixes on bags, as you never knew the state of bags. Five fifty-sixes was an excess of pressure for any size bags.

Several members said they frequently used as many as five.

Leader Williams said he agreed with Mr. Chadwick that five fifty-sixes might be used with comparative safety on large bags, but, on the other hand, was bound to say he had never seen anything extra in the light when more than three were used; and, in reply to Mr. Chadwick, said he referred to blow-through jets taking the hydrogen from the main.

Mr. Mellor had had some years' experience both in the use of cylinders and bags. Supposing the bags were suitably weighted, he could distinguish no difference on the screen. The only fear he had about using oxygen was that you were unable to see what was the state of the inside of the cylinder. The only advantage bottles had over bags was portability. He thought the question to be discussed was how many inches displacement of water is the proper pressure for certain sizes of discs.

The Chairman thought about six inches' water pressure for the ordinary exhibition room, but if you want to use blow-through jets, four inches of water pressure was plenty.

Mr. Chadwick said bags and pressure boards were not a very good mechanical contrivance; the pressure was ever varying according to the position of the pressure board on the bags. He had received a letter from a member asking him to state whether pumice stone, gauze, &c., were necessary in the mixing chamber, to which he might say that he never used anything of the sort.

Mr. Williams advised amateurs who wished to show their pictures to advantage not to use above an eight-feet disc. A large disc weakened the picture, while a medium sized one made it richer and fuller.

Referring to the durability of gas bags, Mr. Chadwick said his present bags, which were in good order, had been in continual use every season for five or six years.

Mr. Okel said he had used his bags many times every year, and he had only had two bags in twenty years.

The ordinary meeting of this Society was held on March 10, A. Coventry in the chair.

The minutes of the previous meeting were read and passed, and Robert Peel and W. Tomlinson were elected members.

The entire evening was occupied in inspecting a collection of members' pictures and selecting a presentation print to be given to each member of the Society whose subscription was not in arrears. Eighty-two pictures were submitted to the judgment of the members, the selection being by ballot; and finally Mr. Chadwick's "View of Conway" was declared the winner.

Talk in the Studio.

Sturmey's Automatic Holders for the Focussing-cloth.—A pair of double hooks in a small metal case, and a convenient addition to the equipment of the outdoor photographer. These will be especially useful in windy weather.

Toft's Bust of President Glaisher.—This will be on view at the studio of the artist, 12, Trafalgar Studios, Manresa Road, King's Road, Chelsea, on the afternoon of Sunday next, the 27th instant.

Restraining Publication of a Photograph.—Last week, in the Court of Chancery, a remarkable application was made with regard to the publication of a photograph, C. H. Turner making an *ex parte* application to Justice Kay for an injunction to restrain a photographer named Stephens, and a stationer named Armstrong, both of Aylesbury, the first for multiplying copies, and both from selling or offering for sale a photograph of Baron F. de Rothschild's house at Waddesdon, Bucks, with the Prince of Wales in the doorway. The application was made on behalf of S. G. Payne, of Aylesbury, by whom the photograph was taken, and who had given an undertaking to Baron F. de Rothschild not to circulate it without permission. It was alleged that Stephens had obtained a copy and had reproduced it, and that the other defendant was selling the reproductions at 6d. a-piece.—His lordship granted an injunction for a week, the plaintiff giving the usual undertaking.

Early Carbon Prints and a Photo-Engraving.—From E. H. Derham, of Boston, U.S. America, we receive a number of interesting specimens. He says:—"I send you the carbon print spoken of in my last, but think it cannot be claimed to be more than twenty years old. Mr. Rowell has no doubt but what that is the correct age of the print, which has been lying loosely rolled up in a drawer with others for thirteen years to my knowledge. It is sent more as a curiosity than anything else. You will see that it is a double transfer from rubber paper from tissue made by Mr. Rowell. His tissue was very fine and delicate, coated rather thinly: very much so to Swan's original tissue, which, you may remember, was very thick, and too soluble for this climate. Mr. Rowell had never seen any of Swan's tissue, however, none being obtainable here till after his U.S. patent was granted in 1867. I send a sample of Rowell's tissue, most likely insoluble now. J. R. Johnson incorporated Rowell's idea of making tissue in his patent of '77 or '79, I forget which. If you can refer to the *Philadelphia Photographer* for 1867, you will find in the March number, and following numbers, a description of Rowell's methods. Mr. Rowell commenced his experimenting with carbon printing when Poitevin's process was published, and keeps it going still. The handbill sent is one sent me by a pupil of mine—a bright Jap—while on carbon. I see that J. R. Sawyer, in a paper just read before the Manchester Society, names *indigo* as being one of the *permanent* pigments used by him. I thought he knew better than that. Indigo is about as permanent as crimson lake—not as much so as some lake I have seen. Here is a chance for the bromide fellers! The other print sent you is an attempt of mine to produce an engraved plate that would give a print somewhat resembling Goupil's. So far as it goes, I think it does a little; but, of course, being a first attempt, it is full of defects. I put about two ounces of powdered pumice to a solution of four ounces soft gelatine in ten ounces water, added ammonia bichromate, and flowed it on to a waxed and collodionized plate, levelled rather thickly. When set, I applied a paper to top surface. When dry, exposed under a negative to *direct* rays of sun, transferred to a plate of metal, and washed out *à la* carbon. When dried, there was a positive containing a graduated grain—graduated photographically—from which I made a squeeze on to a wax, the surface of which was polished bright with graphite, from which an electrotype was made, and that again being electrotyped. The print sent is not as good as the plate will make. I have never seen a process like the above-described. If a tissue could be made containing a grain powder much harder than pumice, I think the positive could be squeezed into soft steel or copper, and a plate made direct. I want the largest grains to settle to the bottom of the gelatine, and so the gelatine and powder must be kept warm in order to allow it to settle when spread on a level surface; and perhaps that could be done by sifting the powder on to the fluid gelatine solution, when it should settle if heavy enough. It would be quite a job to get it evenly full of grain powder; but it could be done. I have never found anyone who could tell me how Goupil's plates were produced. Do you know? I fancy, from examining these prints, that it is by a powder process. If you examine one of Goupil's prints by a magnifying glass, looking across it, light in front of you, the gelatine relief is plainly discernible; also the grain. Not much relief is required to produce an electrotype plate if the grain is all right. I have double the relief in my plate that is needed." The photo-engraving sent by Mr. Derham is vigorous and fully gradated, and we do not remember to have seen a more successful untouched photo-engraving, putting aside such defects as are due to hasty manipulation.

On the Determination of Sulphur in Albuminoids. By W. Kochs.—According to the author, it is the amount of sulphur in albuminoïd which decides whether it belongs to the albuminoïds proper, or to the glutens. Furthermore, it is stated that one may calculate approximately the quantity of glutinous, and of albuminoïd-peptone in a mixture of albuminoïds, such as peptone preparations, when the amount of sulphur contained in the latter is known. The reason the numbers previously given by the author differ from those of Fresenius is due to the fact that Carius' method is not well applicable to albuminoïds, since at the temperature employed all the sulphur is not converted into sulphuric acid. Whether the temperature is kept for two hours at 120°, at three hours at 200°, is immaterial to the final result. On heating higher, explosions generally occurred. Good results were, however, obtained with Liebig's method for determining sulphur. It may be assumed that muscular albumen contains from 1—1·2 per cent. sulphur, but that muscular gluten is quite free from sulphur. For certain bodies, particularly albuminoïds free from ash, Liebig's method is not practicable, owing to the violent evolution of gas. Such bodies are first evaporated with ten times their weight of nitric acid (sp. gr. 1·4) on the water bath, and the residue is melted in a silver crucible with caustic potash and a little saltpetre.—*Journal of the Society of Chemical Industry.*

The Oxyhydrogen Light.—*Nature,* in referring to some remarks recently made by König at a meeting of the Physical Society of Berlin, says:—Dr. König spoke of the disadvantages of the hydro-oxygen lamps, and demonstrated a new lamp constructed by Herr Linnemann, in which the unsteadiness in the light, arising from the fact that in the common lamp the flame burned now in the burning tube and now outside of it, was avoided. In the new lamp the coal-gas or the hydrogen issued from a ring-shaped opening in the burner, while the oxygen in the centre was admitted through a capillary tube, and did not come into contact with the burning gas till outside of the burner. In the middle of the blue flame was seen a bright point which gave the heat maximum. Instead of the lime cylinder, Herr Linnemann used in his lamp zircon plates, which, at the place of the bright point, gave a highly intense constant light. The speaker made use of this light in order, with the aid of the optical bench of Professor Paalzow, to demonstrate by projection a long series of phenomena in connection with the doctrine of the polarisation of light. For all teaching purposes and demonstrations this method of representing the most important optical phenomena could not be surpassed by any other.

Photographic Club.—The subject for discussion on March 30th will be "Lantern Matters." This is a lantern night. Visitors are invited.

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

R. G.—You are quite right, much more care being required in dealing with extra sensitive plates.

Camera Clip.—If the invention is novel, and you properly claim the points of novelty, a patent will give you the protection that you desire.

C. C.—To hand. We have written to you, and enclosed you a letter that was returned by the postal authorities.

C. Ray Woods.—Thank you for the hint. The other matter has, as you will see, been attended to.

E. H. Derham.—1. The interesting particulars which you are good enough to send are published in this number. 2. Your success has been very notable, and we congratulate you.

G. Maill.—The solution is contaminated with organic matter, and you had better make up a fresh quantity. To extract the silver from the old bath, add a solution of common salt until a further addition causes no fresh precipitate. Now collect the precipitate on a filter, dry it, and reduce by fusion with about double its weight of dry carbonate of sodium. If you prefer, you can take the precipitate to a refiner to be reduced.

A. Rhodes.—It is very good of you to send the information, which we have forwarded to those most likely to take steps towards saving the relic from decay; and we shall be very glad to have a copy of the next negative you take.

W. A. Smith.—The details are interesting, but there is no novelty as regards method.

W. J. A.—In your case a small double condenser (convex sides towards each other) should serve well. Try it, and let us know the result.

E. G. G.—Since the article was written great progress has been made, especially in the various systems of shunt winding and composite winding; so much so that the pattern described would no longer be an advantageous one to construct. A person named Jones, who advertises in the *English Mechanic,* makes admirable small machines adapted for such purposes as we gather that you have in view. If you will state your requirements more definitely, we may be able to help.

M. H.—A lens of the rectilinear or symmetrical type is the best.

Geo. H. Wills.—It is to be obtained from any dealer in gas fittings; but we will endeavour to find the address of the maker, and send it to you by post.

H. C.—At the Photo. Stores, 43, Charterhouse Square, and probably from some other dealers.

Photographs Registered.

Thos. K. Biddle (Dartford)—Photo. of Dartford Church.

Appleton & Co. (Bradford)—Photo., Group of Heads of Wesleyan Ministers and Laymen.

R. K. R. Flamank (Aston Manor)—Photo. of Views of Aston Hall.

The Photographic News.

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Fig. I.

The Solar Spectrum.

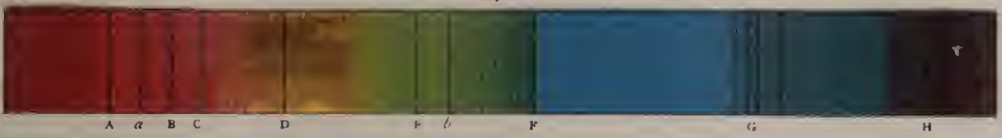
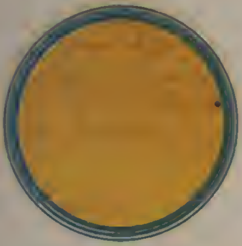
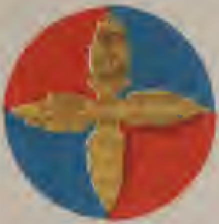


Fig. III.



Subjective Colour.

Fig. IV.



Colour as related to idea of Distance.

Fig. II

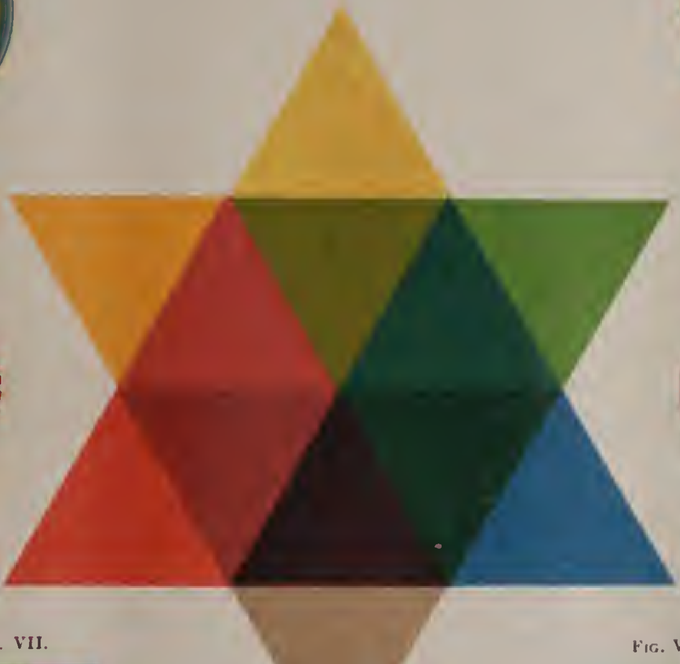
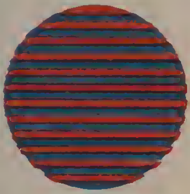
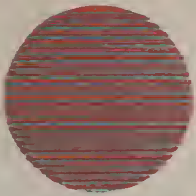


Fig. V.



Effect on Colours of Apposition.

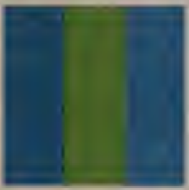
Fig. VI.



Mixture of Colours by Apposition.

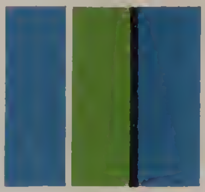
The Primary, Secondary, and Tertiary Colours

Fig. VII.



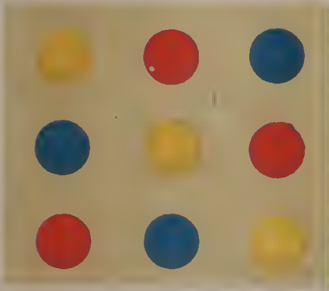
Indistinctness of Related Colours in contact.

Fig. VIII.



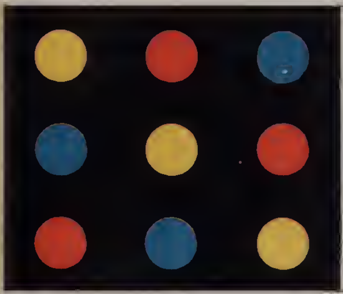
Effect of Black and White in separating Colours.

Fig. IX.



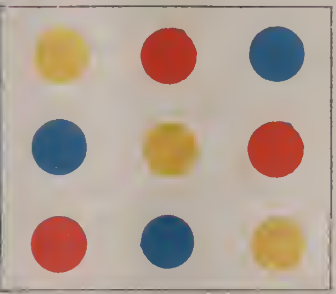
Effect of a Grey Ground on Colours.

Fig. X.



Effect of a Black Ground on Colours.

Fig. XI.



Effect of a White Ground on Colours.

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THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1491.—*April* 1, 1887.

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THE PERMANENCY OF EASTMAN PRINTS, ALBUMEN PRINTS, AND PLATINOTYPES.

In the last number of the *Mittheilungen*, E. Vogel, junior, gives the result of his experiments on the action of chlorine and of sulphuretted hydrogen on platinum prints and silver prints, the conclusions he arrives at being as follows.

Platinum prints when exposed to the action of chlorine gas for several hours are not attacked in the least, whether the chlorine be wet or dry; but silver prints disappear immediately if the gas is wet, and after some minutes if the gas is dry.

Dry sulphuretted hydrogen acts quickly on albumen prints, but does not appreciably change Eastman prints; but when moist Eastman prints or platinotypes are exposed to sulphuretted hydrogen, the former are slowly attacked, and the ground of the latter becomes darkened, this darkening being more considerable when gelatine has been used in the preparation of the platinotype paper than when arrowroot has been employed. This darkening of the ground is not accompanied by any fading of the image.

Vogel considers that the darkening of the platinotype paper by the action of moist sulphuretted hydrogen is due to the presence in the paper of a trace of potassium-platinous chloride, this salt remaining in spite of long washing. He also assumes that by the action of the sulphuretted hydrogen upon this, a dark sulphate of platinum is formed.

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PHOTOGRAPHY BY MAGNESIUM LIGHT.

This subject is now well before the photographic public, the recent fall of magnesium wire to one-fifth of its former price having served to stimulate experiments as to the best means of working.

Our description of a simple form of magnesium lamp last week, has served to bring from F. W. Hart, of Kingsland, a letter in which he claims greater efficiency for a simple form of lamp made by himself. Mr. Hart sends us a photograph of his own lamp, and, as far as we can judge from this, it possesses the advantages of the foreign lamp referred to; but, as regards the relative cost of the two apparatus, we have no data upon which to go.

In connection with the use of magnesium wire, we find some notes in the *Mittheilungen* by Gädicke and Meithe, in which they claim to have obtained some very wonderful instantaneous pictures by magnesium light; for example, an interior with an exposure of one-fortieth of a second. They give no particulars of their methods, but from some remarks by Haberlandt, who recently exhibited a new magnesium apparatus at a meeting of the Berlin Photographic Club, we conjecture that the magnesium is burned in oxygen.

In Haberlandt's apparatus the magnesium is burned in a stream of oxygen, and the arrangement is provided with a flat reflector, which can be revolved either on a vertical axis or on a horizontal axis, and, by the discriminating use of this reflector, various effects in lighting can be realised.

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ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.C.S.*

In order to put into successful practice the general principles which have now been explained, due regard must be paid to the conditions of the particular problem which is to be solved. The character of the effect required will determine both the nature of the sensitiser to be used, and the nature of the screen also. If a general colour sensitiveness similar to that of the eye is required, a bluish shade of erythrosin or rose Bengal, used with a yellow screen which transmits a considerable quantity of green and a little blue, will give approximately the required result. If, on the contrary, as frequently happens in the reproduction of pictures, it is necessary to bring out prominently certain particular colours, a dye must be used which confers especial sensitiveness to those colours. A list of such dyes has already been given, but may conveniently be repeated here:—Cyanine for red and orange, erythrosin or rose Bengal for yellow, eosin for greenish-yellow and yellowish-green, chrysaniline for green. If general sensitiveness to the whole colour scale is required, naphthol blue only is of any practical value.

It is important not to interpret too literally the results obtained with the spectrum. Colour sensations and the colours of pigments do not necessarily correspond with the colours of the spectrum, and in many cases they are very different. In other words, similar colour sensations may be excited by very different rays. The sensation of white light, for example, may result from the combination of the two sensations of red and greenish-blue, yellow and bright blue, green and purple. The sensation of yellow may be produced by the combination of the sensations of red and green, and can thus be excited by rays quite different from those to which the yellow of the spectrum is due. The only method of ascertaining accurately how far the colours of a landscape, painting, or any coloured object, correspond with the colours of the spectrum, is to examine the light reflected from different parts of that object by means of a spectroscope, and one of the convenient pocket forms of this instrument should form part of the outfit of every worker in orthochromatic photography. Further, it is necessary to bear in mind that almost every coloured object especially out of doors, reflects a considerable quantity of white light, which tends to reduce the contrasts that would otherwise result from differences of colour alone, and thus tends to produce truer gradations in the photographic image. This is the explanation of the fact that in photography with ordinary plates a well-exposed negative always gives truer gradations than one which has had only a brief exposure. The quantity of white light reflected depends mainly on the character of the surface of the substance; if the surface is smooth and bright, the amount of white light reflected without undergoing any other alteration will be large; if the surface is dull or matt, the quantity of unaltered reflected light will be comparatively small.

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* Continued from page 148.

Another fact which has to be taken into account is that commercial dyes vary very much in character and purity. Many varieties of such dyes as eosin, erythrosin, and rose Bengal are met with in commerce, and are distinguished by letters or numbers such as erythrosin 1, erythrosin B.B., according to the fancy of the makers. These varieties differ mainly in the shade of colour which they give, and these differences are due to differences in chemical constitution and the methods of preparation. In some cases the same dye is known by very different names, and in other instances dyes which have similar trade names have really quite different chemical constitutions and properties. According to Vogel, French rose Bengal acts extremely well as a sensitiser, whilst rose Bengal of Belgian manufacture gives very poor results. Eosins from different sources are likewise formed to give very different results. The only method of really solving this difficulty is to make an actual trial of the effect of the sample of dye chosen. An examination of the absorption spectrum of an aqueous solution of the dye will, however, afford valuable help in making a selection.

Methods of Sensitising.—There are two general methods of sensitising silver gelatino-bromide with dyes. In the first the dye is added to the melted emulsion before coating, in the second the dried plate is immersed in a solution of the dye, which is usually made alkaline with ammonia. The balance of evidence is at present very strongly in favour of the bath process. Eder states in his "Handbuch" that the best results are obtained by adding the dye to the melted emulsion, but in his later experiments he has used and recommends the bath. Ives, Schumann, and Mallman and Scolik, all regard the bath method as much superior. Herr Loscher stated at a recent meeting of the Berlin Society that in one series of experiments he had found plates treated with an ammoniacal azalin bath to be five times as sensitive as plates prepared with an emulsion to which azalin had been added before coating. The superiority of the results obtained by the bath process are mainly due to the action of the ammonia, which is used either as a preliminary bath, or mixed with the dye solution. The ammonia confers on the plate an increase of sensitiveness far in excess of the decrease in general sensitiveness which would result from the addition of the dye alone, and hence plates treated in this way have a higher total sensitiveness than undyed plates; moreover, the solvent action of the ammonia on the silver bromide in all probability leads to the formation of silver-eosin or silver-erythrosin compounds, which are particularly sensitive to greenish yellow, or yellow respectively.

The Quantity of Dye to be Used.—The proper regulation of the quantity of dye used is a matter of the greatest importance. If too little is added, the maximum possible effect is not gained; but if, on the other hand, too large a quantity is employed, the general sensitiveness is much reduced, whilst the special sensitiveness to yellow or other particular rays is also greatly diminished, and may even disappear entirely. This result may be due to the fact that the excess of dye forms a superficial layer on the plate, and this layer completely absorbs and arrests all the yellow or other rays before they can actually reach the silver bromide. The negative results obtained by Mr. Werge[*] are explained by the fact that far too large a quantity of dye was used.

Addition of Dyes to the Emulsion.—When the dye is added to the emulsion 2-4 milligrams of the solid dye to every 100 cubic centimetres of the emulsion will usually be found to be sufficient, but dyes of high tinctorial power must be used in still smaller quantity (Eder.) Even as little as 0·0001 per cent. of eosin by weight is sufficient to make an emulsion very sensitive to greenish-yellow, although the staining effect is scarcely perceptible to the eye. The most convenient way of adding the dye to the emulsion is to prepare a solution of a definite strength and add a certain volume of this solution to a measured quantity of the melted emulsion, stirring well with a clean glass rod in order to ensure perfect admixture.

Bath Processes.—Various methods of using the bath process have been described. They differ mainly in the proportion and nature of the dye used, and the employment, or otherwise, of a preliminary bath of dilute ammonia. The following account is as complete as the author has been able to make it:—

Schumann's Cyanine Process.—Soak the plates for at least two minutes in—

Ammonia	½ to 4 parts
Water...	200 „

Then immerse for two to four minutes in—

Strong ammonia	2 to 4 parts
Absolute alcohol	10 „
Cyanine in absolute alcohol (1 : 500)	5 to 10 „
Distilled water	200 „

The last solution should be freshly prepared, since it decomposes on keeping. Drain the plate with its edge on blotting-paper, and dry quickly in complete darkness, taking care to touch the plate with the hands as little as possible. The plates used should be of moderate sensitiveness and should contain no silver iodide. After treatment with cyanine they should be used as soon as possible, since they will not keep in good condition for more than about a week. Exposed plates are developed with Eder's modification of the potash-pyro developer,[†] care being taken to keep the development well in hand. The average proportions required are—

A	6 drops
B	6 „
Water	2 ounces

with one drop of a 10 per cent. solution of potassium bromide.

This weak solution should be applied at first, more pyro and potash being added as development proceeds. If the plates are very sensitive a somewhat greater proportion of potassium bromide is advisable. After development the plates should be placed in alum solution.

(*To be continued.*)

A CHRISTMAS HOLIDAY AT THE CAPE—ON THE TRAMP WITH A CAMERA.

BY C. RAY WOODS.[‡]

Instead of getting up at five next morning, I did not awake till nearly nine, and, feeling by no means disposed to travel through the hottest part of what was already a fearfully hot day, I resolved to delay my departure till the afternoon. During the morning, only two or three of those who had figured the previous evening dropped in;

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[*] *British Journal Almanac*, 1887, p. 104.

[†] Solution A.—

Sodium sulphite	25 parts
Sulphuric acid, conc.	0·5 part
Pyrogallol	8 parts
Water	100 „

Solution B.—

Potassium carbonate	90 „
Sodium sulphite	25 „
Water	200 „

[‡] Continued from p. 181.

the rest, I presume, had not yet got over the carouse. Those whom I saw were typical representatives of the colonial youth, hospitable and generous to an inordinate degree; it was their chief fault—a fault which our own forefathers would have esteemed a virtue. Let the reader recollect that in a small colonial town the opportunities of intellectual improvement are absolutely *nil*, and the opportunities for harmless amusement very few and very far between; and they will only regard with commiseration, not with censure, a section of their fellow creatures whose only resource is conviviality. If their pleasures are animal, forget not that no other resource is open to them, and even the best informed amongst them must perforce join in their revels.

During the *morning*, it was only with the greatest difficulty that I was able to keep from what would have been to me pretty hard drinking for an *evening*. Pleading a little eccentricity in some matters—no great difficulty, for tramping about with a camera on one of the hottest days of a Cape summer was eccentricity enough in some minds —I told them that I never drank anything before dinner, and my excuse was taken in good part in consideration of the fact that I had proved myself a "good fellow" on the previous evening. At dinner—which I had no occasion to take alone—I found that the colonial youth does all his drinking away from the table, which shows some sense on his part, for hard-headed as he might be, the double dose would be too much for him. Much the same custom exists in America, except in large towns, and, in fact, in most places away from home where other diversions are scarce. Better luck, then, to the colonial youth of the future, but not the less hearty a tribute of praise to the good-heartedness of the present. The right hand of fellowship after five minutes' acquaintance is a virtue scarce enough in our country to make it thoroughly refreshing when sojourning in a strange land.

It was not until four o'clock in the afternoon that I took my departure, after exposing my first plate on the hotel, which will always bring pleasant recollections to my memory. After a five minutes' walk along the road to Eerste River, I pass a farmhouse to my left; then, turning off to the right, I take the road through the Flats, with a chain of mountains a few miles off to the right, and False Bay, with its long sweep of glaring sandy beach, to my left.

A long dreary tramp for a mile or two. The road is deserted, and not even a tree appears to vary the undulating road. A group of mountains, the same ragged group that I had taken yesterday from near the Pass, is changing its outline considerably, but only too slowly, despite the way I hammer along the road till every portion of my clothing is reeking with moisture. Before me the road comes to a turn at the top of the rising ground, where the group of mountains should appear to me "end on," and so soon as I get there will I take it, no matter what lack of objects there may be for a foreground, for it is now nearly five o'clock, and no work done. Before I reach the top of the hill I hear the clatter of hoofs behind me, and a horseman rides on till he reaches the turn, staying one moment to give his steed a blow before commencing the descent. What a picture the man and horse look perched up there—"a picture of solitude," if I may be excused such an Irishism. It only lasts a brief moment; before I can overtake them, and ask the rider to stop, the horse's head is turned, and the landscape is left as dull and as dreary as it was before. Sadly disappointed I reach the top, but my view of the mountain is not bad to begin work on, so my camera is set up, and the plate exposed. A little further along I again take the mountain, with some cottages in the middle distance. Again the mountain, as its outline changes once more. This "contouring" is getting interesting. Then once again, but this time with a farm, and its rows of vines at the foot.

And now a change comes o'er the scene. I am descending into a little valley, where a group of farmhouses with their thatched roofs and white walls peer out from a thicket of trees, whose presence denotes a copious supply of water, and pictures too, no doubt, but it is the water I feel the want of most. The trees on each side of the road with their thick, *too thick*, foliage, cast a pleasant and refreshing shade, but it is too late in the day for pictures here, the sun is too low in the heavens. Tree plantations in South Africa are thickets; no choice between luxuriant foliage and smiling fields, or arid plain. Outside the hamlet, I adopt the first rising ground as point from which to utilize the houses and trees with another "contour" of the mountains. A mile further on, an occasional fir-tree varies the monotony of the road, and at one spot I have the good fortune to expose two plates on some horses nibbling the scanty grass by the wayside. I always think that early morn or the close of the day is best for photographing cattle and horses; the weak slanting rays of the sun throw into relief every muscle, every hair, of the creatures. In one of my pictures a goodly array of scantily-covered ribs is also thrown into relief, but still one must literally as well as metaphorically "take the fat with the lean," and the lean with the fat.

On again. Yet more monotonous tramping over the hard level road between scanty patches of heather and dull yellow sand. Oh! for a breath of wind to cool the body, or a drop of water to moisten the parched lips. I take the flask from my pocket, but the mixture of spirit and water only burns my mouth and throat. Water at last, and with it a house and some trees. After prostrating myself on the dusty road to take a drink from the streamlet that crosses it, I once more focus a view. Two smartly-attired coloured girls are standing near by, but time is getting on, and I cannot speak Dutch. They would give a little more life to the picture, but not knowing yet that the rising coloured population of South Africa learn English, and a few other things besides, I take my picture without them.

On again. The sun will soon have dipped behind the distant range of hills of the Cape Peninsula, and I am several miles from my destination, with three plates yet to spare. Now up a steep tiresome hill that takes away my breath, and almost all the little energy still left me, till I find myself once more on a bit of level road. The sun has gone down, twilight does not last long, and darkness will soon set in, but the tall spire of Stellenbosch Church is peering over the intervening hill. I expose another plate, not without certain qualms of conscience, for it is mere plate-exposing; still, as I can only change plates at night, it makes no difference—exposed they shall be. Another turn in the road, and, thank Heaven! a picturesque group of trees. Number eleven—but in my haste I draw the slide without putting on the cap; it is not without some sense of relief that I fire off No. 12 and pack up my apparatus. Scarcely twenty yards further, and I come upon a welcome rivulet flowing over rocks spanned by a little bridge. There is yet light enough for a picture, but no plates left. One plate thrown away and another plate spoilt. Here is my punishment for the double sin.

A smart walk of half an hour and I enter, tired out, the hospitable inn, just as it is dark. Only a twelve mile walk, but twelve miles in South Africa, with 18 lb. of impedimenta (possibly more, for I have three dozen plates altogether) with the thermometer over 90° in the shade, and not a breath of air stirring, is not to be lightly undertaken. Here, as I catch the sleepy infection of Stellenbosch, with its principal street at eight in the evening perfectly quiet save for the ripple of the water that runs along the conduits at the sides of the street (as it does in some country villages in England), and as it once did in London, I stretch my limbs and yawn, saying, "That long tramp was a sad mistake."

So ended the second day of my trip, the foregoing account of which is simply a transcription of copious notes made at the time; but, at the end of the last long walk, I was beginning to feel "washed out," and, for the remaining day's doings, I must trust to my memory and the brief record of exposures in my pocket-book. Ten days, however, are not sufficient to dim my recollection of events, and the completion of my narrative will only be remarked by a change from present to past tense.

(*To be continued.*)

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PHOTOGRAPHIC LENSES IN RELATION TO ISOCHROMATIC PLATES

BY W. H. WHEELER (OXFORD).

Your news from Vienna that an astronomical telescope works to focus with orthochromatic plates, though not with ordinary ones, is of particular interest to me, as I had long planned experiments, expecting to discover this very thing. Indeed, I imagine that with care it will be possible to note variations in the interval between the visual and actinic foci of an over-corrected lens—not only between ordinary and orthochromatic plates, but also between rapid dry plates and wet collodion; still more between the different brands of isochromatic and orthochromatic plates, &c., according to their modifying qualities and how far the red or yellow rays, or both, acquire additional sensitiveness in proportion to the blue. I hope some one with more leisure than I, will investigate this matter.

Many of us know that from want of correspondence between the spectra of flint and crown glass respectively, it is impossible simultaneously to correct chromatic dispersion over the entire spectrum. As in ordinary vision the yellow rays are most luminous, and the deep blue comparatively ineffective, these yellow rays would be carefully corrected in the object-lens of a good astronomical telescope, and the outstanding error thrown on those constituting the deep blue margin known as the secondary spectrum, and seen round the image of the moon or Jupiter when highly magnified in a good refractor. With ordinary sensitive plates, the proportionate chemical effects of yellow and blue rays so widely differ from this, that it will not do in photography to sacrifice the blue rays to the yellow ones, and a considerably smaller general correction is found to produce the most distinct photographic image. The practical necessity, however, that the best attainable visual and actinic foci should *coincide*, has dictated the compromise which we use. But though it certainly seems to follow from all this that orthochromatic plates, with which the chemical effects, of yellow and blue rays especially, more nearly resemble visual conditions; should work better than ordinary plates to the visual focus of lenses corrected for vision: I do not feel equally sure that they will be at corresponding *disadvantage* when used with lenses less corrected, and having coincident foci when used with ordinary plates. Perhaps, indeed, if the best possible correction for ordinary plates requires an actinic focus nearer the lens than the visual, while the best for ordinary vision reverses this order: then that amount of correction which gives us coincidence with ordinary plates will be more favourable to isochromatic ones than we might otherwise expect.

In experimenting, it will be well to take special precautions that the visual focus is very accurately obtained. I find it a convenient plan to dispense entirely with the focussing glass; placing, instead of it, a plain glass in the open slide, with a small fragment of printed paper gummed to the posterior surface (corresponding to the place of the sensitive film). I can then adjust the focus with a powerful magnifier until the image and the paper fragment are seen together with equal distinctness, when the sensitive plate may take its place. It will thus be easy accurately to compare different plates with the same lens; and if it be found that well-corrected photographic lenses give fairly good results with all plates, while over-corrected lenses are sensibly more distinct at the visual image with orthochromatic plates than with others, we may congratulate ourselves on the result. If otherwise, to be forewarned is to be forearmed. But also the fact (if it be so) will lend a special interest to the new kinds of optical glass. It is now several years since the labour of the late Vernon Harcourt, in continuation of Faraday's researches, was understood to have resulted in the discovery of various glasses, by combining which the secondary spectrum was very greatly reduced. I do not know whether the new glasses announced from Germany are most valuable in this respect, or in other respects, for the advantages of different glasses are very various, and sometimes conflicting. Very dense flint glass, for example, while highly dispersive, and offering also distinct advantages in correcting aberration, has also a greater irrationality, and leaves a larger outstanding balance of dispersion, than lighter samples. And on the other hand, if a combination of a dense flint concave with a lighter flint convex corrects dispersion more completely, yet the smaller difference of dispersive power may necessitate thicker lenses and deeper curves; which again do not seem to be invariably a disadvantage in photographic combinations. Certainly, however, it seems clear that a more perfect correction of the secondary spectrum can alone give us lenses equally available for plates varying in their proportionate sensitiveness to rays red, yellow, and blue.

Since writing the above, I have exposed an isochromatic plate (Marion), and a Fry's-German plate, carefully focussed with two different lenses. One, a 4A portrait lens by Ross, of twenty-nine inches focus, gave with the full aperture of 3½ inches, good results with both plates, there being little to choose, except that, the object being on toned cardboard, the isochromatic plate appeared to require only about a quarter the exposure of the other. But the other lens, an old Voightlander of exquisite visual definition, but distinctly over-corrected for dispersion, showed a marked difference between the two plates.

It was focussed on two card mounts, one placed behind the other at a distance (about ½ inch) somewhat exceeding that which I judged would, by the difference of conjugate foci, allow for the want of coincidence produced by the over-correction of the lens; so that when I had focussed for the nearer card, the actinic focus of the more distant one might correspond. Using the full aperture of over four inches with a focal length of only fourteen and a half, of course every error would be excessive, and neither of the images were distinct on the German plate, the true actinic focus probably lying between them. But on the isochromatic plate the image of the card which I had focussed, and which I knew could not possibly be sharp on any ordinary plate, was much the most distinct of all. My practical result tends therefore to confirm the report from Vienna, and to encourage the use of orthochromatic plates with refracting telescopes, and over-corrected lenses generally. But I must myself postpone further experiments to a more convenient season.

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HOW WE TRIED TO PHOTOGRAPH THE BOAT RACE.

BY A RAMBLER.

"My friend Jones, a camera owns," and being enthusiastic—as most persons are who are getting through their first dozen plates—in an evil hour requested me to photograph the boat race and show him "how to do it." "Certainly," I replied; "I'll show you how to do it on paper." Thereupon I entertained Jones and his friend with an historical sketch of all sorts of papers, from Talbotype to Eastman rollers. Jones being only a tyro, and his friend knowing still less, I came out of that little oration with considerable *éclat*. Now Jones' friend—his name is Brown—is a man with a good many friends, and once a year he entertains a select few of them in a big barge moored conveniently below Barnes bridge, at a point where the boat race can be seen to great advantage, and it was soon arranged that Jones and I should be on board the barge in good time on Saturday, and that Brown would keep the afterdeck for our paraphernalia. We were to meet at Waterloo and proceed to Barnes by the twelve o'clock train, and Jones had promised that he would assist to carry what he was pleased to call "my plunder." Now at Waterloo the difficulty was to find the twelve o'clock train. In my innocence I had imagined that the "regular" train would be started at twelve as usual, the more so as there was no reason why it should not be, seeing that it called at all stations to Shepperton, while the specials went no further than Mortlake. But it was twelve, and where was Jones? I am heavily handicapped with the "plunder," and cannot hunt much. Suddenly I think I see him, and call his name. "Allow!" says a gruff voice near me, "what the —— are you "ollerin'" at?" The owner of the voice had an unpleasant countenance, and evidently an antipathy to water, even in his drinks. Clearly my friend is not the only Jones.

A passing mutual friend tells me that Jones is in the refreshment room, and I tax Jones with meanness when he arrives a few minutes later. He assured me that the delay was occasioned by his feeling the necessity of calling in at Exeter Hall as he passed down the Strand, or he would have been in time.

We succeeded, after many struggles, in depositing the "plunder" in a carriage, and again in a trap on arriving at Barnes, and drove to the river bank, with a good many "lets" and some hindrances. Jones had an idea that we should know Brown's barge by the flags, but as most barges were in the same condition as regards flags, we spent some time in the position of smugglers on the lookout. We were getting hopelessly bewildered, when a small voice exclaimed, "Please sir, Mr. Brown says, why don't you come on board?" The small voice came from a small boy, who was dressed in full lower Thames barge uniform, and, beyond that his face was very dirty, was not a bad-looking amphibious specimen.

Any how, the boy's dirty face looked very pleasant to me, for I was getting very tired of the plunder of which I had charge, while Jones careered wildly up and down searching for the barge which was right in front of us, but being outside was covered by another one. Following our small leader we safely embarked the plunder in a dinghy, and pirouetted off to the barge, our pilot only using one oar, partly for want of room, and partly to use it as a weapon of offence and defence. After a series of chassez croizeying we reached our destination, and took possession of the after-deck which had been, according to promise, "specially reserved." We took in some welcome refreshment, and I set to work to unpack the "plunder." Jones was by this time evidently careless about his small camera, and the last position I noticed it in was suspended by the tripod between his legs, while Jones himself was explaining to a couple of pretty girls the *modus operandi* of drinking champagne out of small tumblers. The hold of the barge was fitted up with luncheon tables, and I shortly had the mortification of seeing Jones seated among a bevy of beauty, pitching into cold fowl and other luxuries, without deigning to give a look in my direction; but even Jones' capacity was limited, and, after a while, some twinge of conscience induced him to appear on the reserved deck laden with champagne and sandwiches. and now we had to be on the alert, for the flood tide was at its height, and the boats were due. We focussed the centre of the river, and took some snap shots at passing steamers. The tripod points were fixed firmly, and now, as a roar came up the river, the boats also were seen in the distance. With the boats came Jones' female friends to the reserved deck, and it would appear as if Jones, in his excessive politeness, had explained that on the reserved deck, in front of the camera, would be the best place to see the race from.

All the ladies wanted to crowd there, and Jones had his work cut out to make a funnel-shaped opening in front, in doing which I was pleased to see that he lost popularity dreadfully with the fair ones. "Why did he tell us to come here?" said one sweet voice. "I didn't," growled the now unamiable Jones. "You did, Mr. Jones, and I can't see a bit," retorted the voice. I loved that girl, and hoped she would continue "not to see a bit" for Jones' sake, for he had just kicked away one leg of the tripod, and I could not be sure that he had properly replaced it.

And now another trouble cropped up: everyone on the barge appeared to think that by crowding to one side the barge that they would see better, consequently the barge heeled over considerably, and the lens, instead of being directed to take the middle of the river, pointed down to one side of it, as if it would photograph the near bottom instead of the surface. There was no help for it but a rule-of-thumb drag in of the front leg and snap the shutter, trusting to Providence about the race. The roar increases —the camera appears to join in the excitement, and jumps about. The boats pass, the shutter falls, and Jones attempts to release the shutter for another shot, while I reverse the back. Jones seizes the spring, which required a movement of an eighth of an inch, and drags it out at right angles to the camera front, ruining the shutter. The second chance for the steamers is gone, and I say in a slow sarcastic tone, "That will do nicely, Jones; thank you so much, Jones; I think we'll pack up."

And now Brown proves himself every bit a good host, for a powerful tug bearing his house-flag lays hold of the barge, drags her forcibly out of the crowd, and, when in the open, walks her off at about eight miles an hour up to Richmond. As I buckle the last strap I look at Jones with a pious expression, intended to be more in sorrow than in anger, and Jones looks humbly and sadly at me; but the absurdity of the whole thing is too great, and Jones, seeing the pious expression fading, seizes my hand, and cries, "Look here, old fellow, do swear at me; it will do you a lot of good!"

REPRESENTATION OF COLOUR IN PHOTOGRAPHY.

BY C. BRANGWIN BARNES.

From recent experiences which have been published through the medium of the societies and the journals, it would seem that the photographic world is far from being at one on the subject of the superiority of eosine and cyanin treated plates over those ordinarily in use. It is claimed on the one hand that these plates, to which the names of orthochromatic and isochromatic have been given, are capable of giving a much better rendering of colour than the bromide plates, while on the other side we find men of experience flatly denying and contesting the alleged superiority. In a recent article (Year-Book, 1887) Mr. J. Werge writes: "In photographing a scale of colours (pigments) ranging from black to white, according to their degree of luminosity to the eyes, I found that the orthochromatic plates did not translate these colours any better than an ordinary bromide plate; in fact, I think the simple bromide plate had rather the best of it, both in density and degree of translation. . . . I then tried isochromatic plates, with little or no better effect. The yellow pigments were still stubborn, and would not be coaxed into a better rendering." Mr. Werge then goes on to say that he continued his experiments with natural colours in place of pigments with a better result—that is to say, he found some colours received a better rendering, while others did not—and adds that "the isochromatic plate gives the best translation of natural colours in a group of flowers, but it is still far from a true and correct translation."

Mr. Werge does not state whether he used the plates in the ordinary way, or whether he made use of what Dr. Eder tells us is an essential condition of success—namely, the introduction before or behind the objective of a yellow glass. I do not for an instant imagine that this was omitted, and such being the case am obliged to confess myself utterly at a loss to discover by what means the experiments resulted in so unsatisfactory a manner. I have not personally made experiments with either the isochromatic plates or the orthochromatic; but I have been present at such experiments—experiments made upon pigments, and not natural colours—and must state at once that the results were to the absolute contrary of those of Mr. Werge. The first subject experimented upon was a picture representing a basket of fruit (black and white grapes and a green melon), a lobster and some prawns, together with vine leaves displaying autumn tints; the whole containing most of the colours considered generally to be those most difficult of correct translation by means of ordinary photography.

The first plate exposed was an ordinary bromide, and then under exactly the same conditions an isochromatic plate was substituted, followed by an orthochromatic, both of the latter being commercial plates, and no yellow glass being used. On development the result was found to be as follows:—The bromide plate represented nearly every part of the picture in darkness, the light on the melon (yellow) did not show at all, and the distinction between the white and black (or rather purple) grapes was not visible; the leaves were very faintly outlined, their colours photographing much the same as the dark background, and the lobster showed the gradations of light and shade very faintly indeed, the red, orange, and yellow all coming out of much the same shade. The isochromatic plate was a decided improvement upon this, though far from perfect. The grapes were now shown to be of two shades, and the yellow lights on leaves, melon, and lobster, were more strongly indicated; while the orthochromatic plate seemed to go, if anything, a trifle farther in the distinctions of colour; still, no one of the three gave anything like a perfect picture.

The yellow glass was then placed behind the lens, and three more plates exposed. (I would here draw attention to the fact that this yellow glass must be specially prepared by careful grinding of the sides, or it will thoroughly spoil the sharpness of the picture. Glasses properly prepared and tested are in the market, and can be readily purchased.) On these plates being developed the difference became at once apparent. The bromide plate was no better than the first, but both of the others were vastly different; the nearest approach I have yet seen to a true gradation of colours being produced in the case of the isochromatic plate, which was clear and brilliant in the extreme, the lights and shades being all truly and clearly depicted, and the yellows especially photographing as they appeared in the painting. The plates used were all of English make, which may perhaps account for the difference between the results and those of Mr. Werge, who will no doubt, ere long, let us know the result of his further experiments.

Imagine these plates being brought into play when we have one of those fine (*sic*) old paintings, all yellow and black, to copy; and how different will be the result to the old mass of black with a few lines and dabs of dirty grey.

I would advise all photographers interested in the question of these plates not to take for granted what is said by any writer or speaker on the subject, but to experiment for themselves; and I am confident that however firm disbelievers they may be to commence with, they will soon become ardent admirers and frequent users of the isochromatic plates, by the aid of which they will be able to reduce the retouching on portraits as well as on copies of paintings; photographing freckled and red-haired subjects will become a pleasure instead of an infliction; and if it is at present a pleasurable occupation to photograph a golden-haired siren, what will it be when we know that golden hair will appear justly represented in the photograph?

PHOTOGRAPHY AT NIAGARA FALLS.

BY CHARLES R. PANCOAST.*

It may seem the height of presumption, on my part, to grapple with so vast a subject as Niagara; but while in Buffalo last summer, I was enabled to make frequent photographic trips to the falls, and therefore trust that a few words will not prove uninteresting. For the benefit of those who may contemplate a trip in that direction, I will endeavour briefly to describe some of the most accessible and interesting views to be obtained.

Since the opening of the State Reservation, and the consequent demolition of the unsightly mills and buildings that formerly marred the beauty and grandeur of the place, many views hitherto inaccessible have been opened up. Primitive simplicity, unaided by art, is now one of the great features of Niagara, and one thoroughly appreciated by the lovers of the picturesque; another feature of the Reservation being the almost entire freedom from "fees," and the annoying solicitations of hackmen and guides.

Those familiar with the geography of the Niagara River are aware that the falls face the north and the north-east, consequently a large proportion of the views must, of necessity, be made against the light. This fact, of itself, renders the photographing of the swiftly-rushing waters an unusually difficult task. The best time of the year is undoubtedly in the month of June, when the early foliage is at its prime, and before the excursion season has fairly opened. I speak from experience on this point, having suffered from the annoyance of unwelcome "figure compositions" suddenly presenting themselves in the field of view.

At that season, the sun being in its most northerly position, the light upon the falls is at its best. Ordinarily, a bright sun is best adapted for general work, although it must be remembered that, in views of the rapids, especially from the American side, an overcast day will give much the softest results. This, I may say, is true of any view in which there are harsh contrasts.

Two great enemies of the photographer at Niagara are wind and spray. While the former holds sway, it is useless to attempt any work. The latter is by no means a constant quantity, and successful views of the falls proper can only be made when it is at its minimum. Attempts to render what appear to be fine spray effects result only in hopeless fog. My experience has been, that it is far preferable for the casual visitor, having but a limited time at his disposal, to eschew the difficult subjects, unless under the most favourable circumstances, and confine operations to views readily attainable, and such "bits" of picturesque scenery as may strike his fancy.

Photographing the falls from below is attended with so much risk and discomfort, that even the most ardent amateur may be excused from making the attempt; especially is this the case when the results obtained, even under the most favourable circumstances, are not commensurate with the time and labour expended. I have been informed by some of the resident photographers that during the year there are indeed very few days on which really good pictures of the falls from below can be made. It is useless to attempt photography at Niagara without an exposing shutter capable of giving exposures from 1-10 to 1-100 of a second; my own experience being that with very rapid plates the best results were obtained by using as large an aperture as was consistent with fair marginal definition, and as rapid an exposure as any shutter would produce. I am convinced that a larger amount of detail is obtained in this way than where a slower exposure is made with a smaller stop. The extreme darkness of the foliage about the falls is such as to render the developing of very much detail almost an impossibility, especially so when contrasted with the brightly illuminated water. Plates showing a decided tendency to "softness" will, therefore, give better results. In order to proceed systematically, the photographer should commence in Prospect Park, as early in the morning as possible, and gradually work around over Goat and Luna Islands, finishing with the Sister Islands about noon.

Views from the Canadian side are best made in the afternoon. I may remark here that neither the American nor Canadian Customs officers stationed at the new suspension bridge make any objections to photographic apparatus, unless, however, the enthusiastic operator is sacrilegiously inclined, and desires to profane the Dominion Sabbath, then the "blue-nose" official will doubtless interfere. The virtuous Canadians evidently draw the line at photographing on Sunday. On clear days, when the falls are comparatively free from spray, some very fine effects are to be had from a point near where formerly stood Table-rock. From a point on Clark's Island, about three-quarters of a mile above the Horseshoe Falls, a fine view of the Canadian rapids can be made. Late in the afternoon, when the shadows fall obliquely, the effect of the turbulent water is superb. For views of this character, it will be necessary to increase the speed of the shutter considerably, otherwise the swiftly moving water in the foreground will be so much blurred as to spoil the general harmony of the result.

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* Read before the Photographic Society of Philadelphia.

To one fond of engineering subjects, the cantilever bridge of the Michigan Central Railway will prove both pleasing and interesting; the best point from which to make it being what is known as the "Old Maid of the Mist" landing, about half a mile above, and reached by a good road down the bluff. The walk along the bluff below the town of Niagara Falls, after passing the mills, is picturesque in the extreme, and affords some excellent subjects. I did not attempt any photographs of the Whirlpool Rapids, and, therefore, cannot say when and how the best views are to be made. From casual examination, however, I should say that the Canada side, after about 1 o'clock in the afternoon, would offer the most advantages. Having thus, in a general way, given some idea of the photographic work to be made about the falls, I must say that, in a field so rich and varied, it is impossible to establish any given route or class of subjects; let the results proclaim at once the individuality of the artist.

Buffalo offers but few inducements to the pictorially inclined. The ruins of Fort Porter, on a high bluff overlooking the Niagara River, and those of Fort Erie on the Canada side, immediately opposite, are subjects which, if not picturesque, are of great historic interest. The government breakwater, at the mouth of Buffalo Creek, offers favourable opportunities for instantaneous views of the lake marine.

To those who may be interested in technical points, I will say that the pictures exhibited were all made with a Ross Rapid Symmetrical lens of 7½-inch focus, using an aperture of F. 16. The shutter used was one of my own construction. Plates by Cramer, developed with a pyro and soda developer, prepared in accordance with a formula given me by C. H. James.

AN EXTRAORDINARY MEETING.

We have received a report of a meeting, which report the sender says he picked up in the neighbourhood of Aldersgate Street on the evening of Thursday, the 24th inst. Our correspondent does not vouch for its accuracy; nor, of course, do we. The report starts off as follows.

A. Hubbub. As this is my meeting, I have a right to take the chair myself if I like.

A Member. But would this be quite in order?

A. H. I can prove it. I paid for the room. Now I'm going to show that everybody is wrong, and that I only am right. I have here a piece of blue foolscap (*laughter*). I say I have here a piece of blue foolscap (*renewed laughter*). I can prove it's a piece of foolscap; my name's written on it; but someone has had the bad taste to cross it out (*No! never!*) I was nominated to be on the committee of the Association.

A M. No.

A. H. I can prove it. I saw Mr. Smith, who has just said "No," write my name on the bit of blue paper at the annual meeting.

A. M. But my name's Jones.

A. H. I can prove it's Smith.

Jones. But I was in New York on the night of the annual meeting.

A. H. I can prove you were here.

J. But I've got no hands to write with (*holds up stumps*).

A. H. I can prove you've got hands. But this is a bye point. I don't place much reliance on this. Another of my grievances is that I was not elected chairman, treasurer, secretary, and general dictator of the Association.

A. H. then entered upon a detailed list of grievances which took two hours and a quarter to read. The gist of the remarks was imperfectly understood, but an impression prevailed that he was desirous of charging the management of the Association with arson, sheep stealing, the confidence trick, skittle sharping, piracy on the high seas, keeping fowls to the annoyance of their neighbours, and with systematically snubbing their mothers-in-law.

A. M. No, no.

A. H. I can prove it. But these are bye points, and I don't place much reliance upon them. Now I will come to the real point.

Members. No, no. Time!

A. H. Well, I'll move my resolution: "That this meeting views with the utmost horror, indignation, and abhorrence not unmixed with dismay, the behaviour of the management, because I was not allowed to take home the minutes of the Association, and read them comfortably by my own fireside." I second this resolution. Carried.

Members. No, no.

A. H. But I can prove it. Well, I want to satisfy everybody (*laughter*). We'll take it another way. I have here two hats borrowed from two gentlemen in the company. They are genuine hats, and anybody can examine them. I also have nothing up my sleeve. Here are a number of pieces of paper—ordinary paper—and this is a pencil of the usual commercial character sold at one penny. All that each one has to do is to write "Yes." Nothing can be simpler.

A vote was taken, when eighteen voted against A. Hubbub's resolution, and six voted for it.

A. H. My resolution's carried.

The Meeting. No, no.

A. H. I can prove it. But it is a bye-point, and I don't place any reliance upon it. I should like every word I have said written down. Stay! I will do it. I will write myself down an ——

At this point the manuscript abruptly breaks off, and how Mr. Hubbub intended to finish his sentence will, unhappily, never be known.

PHOTOGRAPHY BY THE AID OF THE PHOSPHORESCENT TABLET.

BY F. E. IVES.*

Photography by the aid of the phosphorescent tablet is not a new discovery, having been known since 1880. It is not even a practically useful method, and is interesting only from a scientific point of view. My own experiments with the method having resulted in the discovery of certain facts not previously known, I have been persuaded to show the results, and make some remarks concerning them.

The facts, already well known, are that Balmain's phosphorescent paint, which probably consists chiefly of sulphide of calcium) in a suitable vehicle, becomes luminous when exposed to light, and the light emitted acts powerfully on photographic sensitive plates; also, that heat releases phosphorescent energy. Solarized phosphorescent tablets have been used as a source of light for contact printing in the dark-room, and negatives have been made by exposing the tablet in a camera, and then making a contact exposure on a photographic sensitive plate in the dark-room. Such a photograph I now show. It has a somewhat granular appearance, due to the coarseness of the particle of sulphide of calcium, and, although the lines are partly sharp, they appear surrounded by a sort of halo. The editor of the *British Journal of Photography*, in a recent editorial, advanced the theory that this effect was due to the spreading of the phosphorescence, and that it would be impossible to obtain a sharp camera photograph by the aid of the phosphorescent tablet. My belief is that the phosphorescence does not spread, and that the effect is due merely to the fact that the luminosity of the phosphorescent coating extends to considerable depth, and the light from the lower part of the layer acts diffusely, because it is radiated from a point at some distance from the surface of the photographic sensitive plate. To test this, I exposed a tablet in the sunlight until fully solarized, then removed it to the dark-room, and placed it in contact with another tablet under pressure. It was impossible to discover any communication of phosphorescence by contact, and, if any occurs, it is insignificant.

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* Address to the Photographic Society of Philadelphia.

I also observed that prints and camera impressions, on my tablets, appear perfectly sharp to the eye, and found that they could be reproduced sharply by photographing in the camera. I therefore conclude that it is possible to make sharp camera photographs by the aid of the phosphorescent tablet, but that the method has no value, because it is always easier and better to make photographs in the usual way.

It has been suggested that the tablet might offer some advantage in the reproduction of coloured objects. It is true that the colour sensitiveness is not the same as that of silver-bromide, but the difference has been found to be altogether in favour of the silver-bromide.

The second known fact that I mentioned is, that heat releases (exhausts) phosphorescence. It does not appear to have occurred to any one that this might be made a means of producing camera pictures by the action of the heat, until I discovered that the obscure heat rays of the lime light spectrum produced a strong impression on a solarized phosphorescent tablet.

Notes.

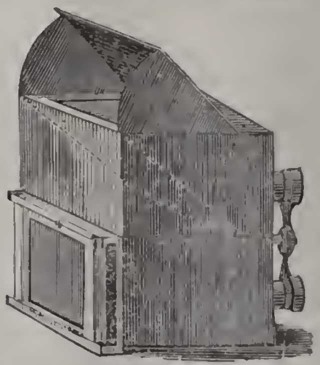
The difficulty of deciding what is really an improper photograph has received fresh exemplification this week in a case brought before Mr. Saunders at the Thames Police Court. An itinerant vendor was charged on the evidence of a police constable with selling photographs of the kind in question, and the magistrate, having looked at the cards, said he had seen ladies act in a more improper manner at the opera houses than those in the prints were supposed to be doing; and discharged the defendant. In this case the defendant was fortunate in being taken before a magistrate who knew what comic opera was like. The sensitive constable who made the charge had probably not had the experience of his superiors, and hence was much shocked at these photographs. The case seems to show that what is called impropriety is, after all, only a matter of comparison.

M. Frappa, whose picture, "General Gordon's Last Moment in Khartoum," is likely, from the nature of the subject, and the skill with which it is treated, to attract considerable attention, has been wise in having his earlier works photographed. In addition to the painting already mentioned, some half a dozen pictures are exhibited in the Gallery, 48, Pall Mall, but only a complete idea of the versatility of the painter is gained by an inspection of a portfolio containing over thirty photographs, most of which have been exhibited in the *Salon*. Very few painters, we fancy, have their pictures photographed, yet one would think, after parting with a painting, they would like to retain so reliable a record of their work as photography can alone give.

The *Globe*, commenting on Stoddard's article in the *Century* magazine on composite portraiture, hints at the possibility of combining the features of a certain number of politicians, so as to get the Tory, the Liberal, and the Radical type. Our contemporary does not say this in so many words, but this, we take it, is the purport of its observations. We doubt the advantage. A good many men are friends only as long as politics are kept out of sight. Now if everybody was familiar with political "types," Jones would be sure to look upon Robinson with disgust, because he (Jones), a Radical, could not help detecting in his friend's face the characteristics indicative of Toryism, and *vice versa*. Besides, as no one should wear his heart on his sleeve, so also it would be a mistake to carry one's politics written in the face. We trust no one will attempt to produce the political "type."

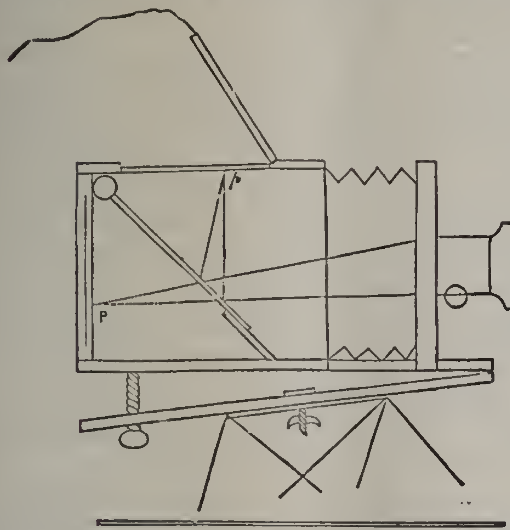
It is seldom so miserable a farce has been enacted as that at a meeting called by the self-nominated member of the committee of the Photographers' Benevolent Association. So far as could be gathered from the incoherent and self-contradictory remarks of the instigator of the meeting, he sees ruin for the Association because at the general meeting his name, which was on a list of nominees for the committee, written by a member for his own private guidance, was withdrawn, to use the member's own words, "because in the course of the meeting he (the nominee in question) made erroneous statements, refused to be ruled by the chairman, and behaved in such a way that I did not feel justified in being responsible for him." Unable to find a nominator, the would-be committee-man nominated himself, and, by some inconceivable muddle, chose to assume that this scrap of paper was an "official" list, and lashed himself into a state of childish indignation in consequence. It would be tedious to indicate even a fragment of the rigmarole which formed the general groundwork of his complaint. Suffice it that, after being contradicted pointblank at every stage and challenged to put his statements to the proof, he utterly failed to establish any one point, and the meeting, by a majority of eighteen to six, emphatically declined to "express indignation" and agree with him that the Association was improperly managed "with regard to the right of free discussion by individual members." Not only so, but immediately afterwards the meeting passed a vote of confidence in the executive.

A correspondent, who is evidently not very well up in the history of the camera, refers to our issue of last week, and asks us what we mean by "the reflecting arrangement to the focusser." So often has this sort of arrangement been described that we are surprised that there should be one reader unacquainted with it and its advantages; but, in case there are others, we reproduce a sketch from the Year-Book for 1882, illustrative of an article by C. M. Whipple. The lower compartment is an ordinary camera, and the



upper is a finder in which the image is reflected upwards on to a horizontal ground glass, a hinged lid with side flaps serving as a shade. This sort of arrangement is, however, very much older than 1882.

Sutton's single reflecting camera, patented over twenty years ago, is shown below. In this case the reflector is hinged, and when the exposure is to be made it is turned up so as to cover the ground-glass. The single reflecting camera has been claimed by patentees very many more times than the double, but both forms are now so well known that really the Patent Office ought to refuse to grant any more patents, as there are persons who seem to suppose that a patent granted for an old invention affords some protection.



In connection with this subject, a curious question may arise. At present, any person who sells an article as "patent" when it is not patented, is subject to a penalty; and it would be interesting to know whether a person holding a patent claiming to cover a well-known article could be prosecuted for representing his article as protected by a patent.

Some photographs now attracting much attention in the windows of the principal London print dealers remind one forcibly of Hamlet's moralisations over the skull of Yorick. They are portraits of mummified Egyptian kings, and are now shown three thousand years or so after the originals lived, for the delectation and wonder of a gaping crowd. A particularly ghastly and grotesque face is that of Rameses II., the monarch to whom tradition assigns conquest and the extension of his kingdom. The juxtaposition of the ancient and modern thus effected by photography has never been more curiously exemplified.

The report of six years' work of the City and Guilds of London Institute is not altogether an encouraging document. The Finsbury Technical College and the School of Technical Art in Kennington Park Road are thriving institutions, but the Technical College at South Kensington, built at a cost of £80,000, is a failure. When against 150 day and 700 evening students at Finsbury, South Kensington can only show 63 day scholars, and no evening students at all, what more is needed to point the moral of the fatal delusion which led the City authorities to play into the hands of the "Ring"? We have on previous occasions asked for some results of the photographic classes in connection with the Institute, but no information was elicited. Has the support been so scanty that these classes have been discontinued?

By our law of copyright every publisher is obliged to forward to the British Museum a copy of every book or pamphlet, large or small, as soon as it is published by him. It is now suggested, and rumour even goes so far as to say that an M.P. is drafting a bill embodying the proposal, that in the same way every artist in the country shall be legally bound to send to the British Museum, or possibly to South Kensington, or the National Gallery authorities, a photograph of every picture he actually completes for sale, exhibition, or what not. There would thus be a complete record, a kind of illustrated catalogue, in fact, of the art production of the country, which might be still more complete were sculptors, engravers, etchers, and, in fact, all artists in the widest sense of the term, bound in a similar way to make photographic notifications of their successes, and failures, too, for that matter. It would certainly be an interesting experiment, and we have a notion that the result, were the entire art production of the country focussed in the manner proposed, would be to astonish everyone at the enormous aggregate of the artistic "output" which would be thus brought to light.

Persons are very much put about how to describe a vignette portrait. A worthy countryman the other day found himself in this difficulty. He had had his portrait taken in two or three styles, a vignette being among the number, and when he came to selecting the one he liked best, he remarked: "I say, Mister, you do me half-a-dozen of that there cloudy one. You knaw what I mean, doan't you?—where my head be a standing on nou't."

EXHIBITING AND EXHIBITIONS.

BY H. P. ROBINSON.[*]

I THINK all will agree with me that the chief event of the year to our Society is the Exhibition, and that it is the duty of every member to make it as perfect as possible, so that those who are interested and want to know what is new in the science, and true in the art of photography, may come here every October and judge for themselves. The outside public learns from our exhibitions the progress one of the three wonders of the nineteenth century is making; and the photographer, whether professional or amateur, acquires a knowledge of what his brethren are doing, and perhaps picks up new ideas, fresher inspiration, and intensified enthusiasm.

The time is now coming when wise photographers who look ahead should begin to think of what they shall do for the autumn shows, although I fear that too many are content to send a selection from the work done during the summer—work done without any special reference to exhibitions. In selecting your pictures, it is perhaps needless to tell you to send of your best, but it is not given to every man to know what is his best. The good and the bad, like the often quoted sublime and ridiculous, are sometimes so nearly related that it is difficult to class them separately. It is our occupation to pursue shadows, and photographers, especially when judging their own works, seem inclined to "listen with credulity to the whispers of fancy, and pursue with eagerness the phantoms of hope." The quality of a large part of the work now contributed is much higher than it was ten, or even five years ago; so that anything sent to future exhibitions must be something more than good ordinary photography, if it is expected to claim more than a passing glance from the visitors.

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[*] A communication to the Photographic Society of Great Britain.

It is a great mistake to send too many pictures; it is giving points against yourself. By doing so you run serious risk of breaking the eleventh commandment, and being found out. I have often seen and admired two or three good pictures, but that admiration has dwindled down to something like disgust when I have come to a lot of inferior work by the same hand, plainly suggesting that the good pictures were flukes, or happy accidents, and that the photographer could not distinguish good work from bad. It is quite astonishing to me how so much bad work, even now, finds its way to exhibitions. Photographers who would soon see the mote in the eye of another man's photograph, cannot see that there is anything the matter with their own. It is human nature, I suppose, to fancy that own geese are swans, and it naturally follows that—

"Like Katerfelto, with his hair on end
At his own wonders,"

we feel sure the public will be delighted with our apprentice efforts, which to us look so like the work of a master.

There were many things sent to the last exhibition—I saw them amongst the rejected, and, I may add, also on the walls—which showed a very imperfect knowledge of what ought to be offered for exhibition. Yet, I must confess that curious inconsistencies sometimes occur. The stone that the mason has refused has been known to become the corner stone of the building. I once saw a picture placed very high over a door, evidently taken at random from among the rejected to fill a space, which afterwards took a medal at another exhibition. I have also seen the reverse of this. I have known a picture which took medals in several of the most important competitions, entirely rejected by the judges at a village exhibition.

It is very difficult to put any limit to the number of pictures to be sent by each exhibitor. I don't mean in the interests of the exhibition so much as of the exhibitor himself. It is possible to get weary even of great excellence. I take an illustration from the last exhibition. There were five large frames sent to show what could be done by a particular maker's camera, and which, therefore, should have been placed among the processes. Each frame contained a large number of small pictures, many of them quite exquisite little gems, all of them good, but so numerous that the eye tired. I was one of the Judges, and, therefore, sworn by our inexorable President to study every picture, and I did not feel kindly to the hangers for admitting so many of these advertisements, beautiful though they were; yet the hangers had not hung all of the frames of the same kind sent in by this one exhibitor.

On the frames the exhibition depends for its general effect only second to the pictures they enclose. The harmonious effect of our last Exhibition was seriously marred by the inappropriateness of many of the frames, and more especially by those of two conspicuous exhibitors, to which I do not think there would be any impropriety in alluding. There were some foreign pictures, so fine in themselves that they well deserved the place of honour they got; but they were shown in mounts so glaring and vulgar, that they seemed almost to defy the hangers to accept them. Opposite to these foreign productions, also honourably placed in a centre, which the pictures well deserved, were some magnificent Yachting Scenes, in a frame that made an eyesore to that side of the room. These prints were mounted in cushion-shaped rims, set in red flock paper, a most disastrous combination. Metal rims always look cheap and common, and are only fit for the sixpenny positives done by our nomadic brethren on the beach; the cushion is the most inartistic of all forms, and nothing could be more damaging to the colour of a silver print than red flock; it is even one degree worse than aniline dyed plush. Both sets of pictures reached the perfection of their kind, and it was vexing to see artists who could do such good work, do themselves so much injustice by their way of showing it.

It is very difficult to give any definite directions about framing. Taste is so wide, that it will not be dictated to; but there are some things so positively injurious to the general effect, that they should be vetoed. The only thing at present objected to in the Prospectus for the Exhibition issued by the Council is the Oxford frame. To this might be added all oval frames, black frames, white frames (we had some white frames in the last Exhibition), and all glaring and violet coloured mounts; the flocks are especially detestable, and there are some cold, blue-grey mounts, much affected by some exhibitors, which are utterly destructive of harmony. I should be sorry to object to novelty in framing, but I would strongly object to dangerous eccentricity.

It is easy to object, not so easy to suggest; but I will try. In an ideally perfect exhibition all the pictures would be framed in gold, or something that would look sufficiently like it. This is the rule at the Royal Academy, and at nearly all the principal exhibitions of paintings; no card mounts of any kind are allowed inside frames, unless they are gilt. We cannot be so strict here; but we may ask our exhibitors to strive for something like conformity. English gilt frames are no doubt the best when cost is no object; but for purposes of exhibition, I am willing to admit that the German moulding, which has so much improved of late years, is good enough. I would also admit to photographic exhibitions light oak or other wood frames, or these frames partially gilt, so as to harmonise with the gilt frames; but I would abolish anything that would make a blot on the walls. I should also like to see the mats, or mounts, inside the frames, gilt, or of some delicate warm tint. Crude white does mischief; so does cold grey. There is no necessity for these mounts to be so wide as they sometimes are made. It is not fair to take up the space in an exhibition where space is limited by a display of plain paper.

The above remarks on framing are said on behalf of the Exhibition; it will be only just to say a word to the exhibitors on their own behalf. It is useless to deny that considerable damage was done to frames last year which ought not to have been done, and it is hoped that the cause has, to some extent, been discovered, and that it will not occur again; but exhibitors must not expect to have their frames back from an exhibition in all their pristine freshness. A good deal of damage is done at every exhibition, from the Royal Academy downwards. It has been calculated, I do not know with what truth, that the frames that go into the Academy each year come out again with about £2,000 of their value taken off them. A few years ago I sent an oil painting in a new frame to a Provincial Exhibition of Paintings. It was returned to me before the opening of the exhibition, because they had so damaged the frame and scratched the picture, that it was not fit to exhibit. My advice, therefore is—Don't go to too much expense in framing your pictures, but let them be framed decently, and so that they will agree with others.

The back of your frames should demand as much attention as the front. You should be very careful that no nails project. When they arrive it is impossible to avoid stacking the frames together, and if nails project it is as much their nature to scratch as it is that of an angry cat, and damage must happen.

Never send two pictures of the same subject, unless the second picture illustrates a process, and is intended to be hung in the process corner. Nobody wants to see two pictures which differ only in size. However much you may appreciate your picture, you need not send a lot of them. I mention this because I have seen as many as three prints of the same subject hanging in this room at the same time, and in this particular instance they did not vary even in size.

And now I am going to say a few words on that very tender subject—hanging.

The first duty of those who provide an exhibition to which the public are invited, is that it should be sufficiently worth seeing to repay the latter for the trouble and expense of going to see it. To do this, what is most worth seeing must be hung in the places where it can best be seen, and the whole show must have a good general effect. The second thought—not the first—must be for the exhibitors, and how to do them justice, if possible, and to do as little injustice as can be helped. That there must be some mistakes is inevitable, and always will be until this becomes a perfect world, when perhaps photography itself will be superseded by something better. Not only must flagrant injustice be avoided, but too strict justice also. A producer of a muddy, out of focus, slate-coloured enlargement, could scarcely but feel, when he sees his picture on the line, that he has not only been well hung—but gibbeted.

The difficulties in arranging the pictures increase year by year as new processes are added to our stock. There was a time when the only considerations that arose were, which were the best pictures, and how were they to be fitted together. No regard had to be paid to their colours, as they were all printed alike. Hangers now have to be always on the look out that prints of different kinds do not get so near together as to murder each other. I have seen a vulgar, large, black and white head, printed on pink albumenized paper, utterly destroy a group of most delicately beautiful platinotype prints; and what could be worse to the general effect of a room, as well as their immediate surroundings, than the cold, faded, slaty-grey of bromide prints, especially when of large size? It is getting increasingly difficult to know what to do with such pictures, short of rejecting them altogether, or spoiling the exhibition. It is possible that in time these prints may be improved in colour, then these remarks will not apply.

I think that hangers and judges insist, sometimes, too much on anonymity, and perhaps I may add, impartiality, although it requires all my temerity to say this. To begin with, it is impossible to keep up more than the pretence of the anonymous. An expert does not fail to recognise the work of well-known exhibitors, and it is scarcely fair that the others should not be known also. It is absolutely necessary, if our exhibitions are to be representative, that the names of the exhibitors should be known to the hangers. There can be little doubt that an exhibition depends, apart from its business management, on its general effect and the beauty of the pictures exhibited; but there should be room found for a few pictures which have nothing pictorial nor any novelty of invention to recommend them, and their interest should depend solely on the name of the producer. I will give an instance.

When any man writes or talks a good deal which appears to be very sensible about photography, when he apparently spends a good part of his life in trying every plate and developer that is recommended with a series of his own modifications to each of them, when he tests everything that he uses even to destruction, and is wildly anxious that his work should be permanent and never die, then it is interesting to see that man's work, that we may be witness to what use he puts his knowledge. In such a case, which is quite suppositious, it is not the beauty of the work which should be considered, but the interest is founded on what sort of work that man produces. An absolutely impartial and just hanger would perhaps turn these interesting works out. But an impartial man is a mere machine.

Here is another case for partiality which I commend. The works of members, always providing they are good enough and not excessive in number, should be preferred to the exhibits of those who only occasionally make use of the Society's Exhibitions at the cost of a few shillings. Of course there must be exceptions to this rule as to all rules. It may happen that an outsider sends in a supremely fine work—then all ideas of rights of the members should be thrown to the winds, and the fine work should have the best place.

Yet another instance of commendable partiality. If an old exhibitor (one who has done much for photography and photographers) sent in presentable work, I confess that I should not only consider the work before me, but I should certainly think of the benefits that man had conferred on the art; and, if it could be done without injustice to others, I should "be to his faults a little blind," and give his work a rather better place than perhaps it intrinsically deserved. This is another reason for knowing who's who.

Every year there are some complaints about the hanging, and it would be astonishing if in a Society of nearly 500 members a few grumblers could not be found; and sometimes, if we could only forget that no hangers are perfect, they have just cause. But the members have it in their own hands. I have not the authority of the Council for saying so, but I have no doubt that that body would welcome any member of the Society, who has any aptitude for the office, who would volunteer his help in the selection and hanging—and in sharing the blame. I mention blame only, because there is never any real praise for hangers, however well they may do their work.

I hear it has been suggested that a real cure for all our difficulties would be found in a committee of twenty-five [to manage the selection and hanging. This appears to me to be a youthful suggestion, born of inexperience. Two Kings of Brentford might be well enough, but I cannot imagine twenty-five of them smelling at the same rose. It would be as easy to ask for five-and-twenty volunteers as to call spirits from the vasty deep, and as effective. It should be quite understood that the duties of those who undertake to arrange the Exhibition do not consist in walking in and out of the room two or three times a day, and finding fault, and interfering with the real workers. Five minutes of inexperienced advice is scarcely of any real assistance to those who have done the work for years. What is wanted in a hanger is one who can afford to give six or eight hours a day for several days, and at the end to lengthen his days by stealing a few hours from the night.

To conclude, I should wish to impress on you three things:—

To produce every year a few pictures especially for exhibition.

To send only a few of your choicest works.

To frame them reasonably, so that they may do no mischief to their neighbours or themselves.

Finally, when you find you have not got the best place on the walls, attribute the misfortune to fate, your luck, even want of quality in the pictures—anything rather than to the want of consideration or neglect of those hard-working and much-abused members, the hangers; and, if you should find yourself rejected altogether, comfort yourself by thinking that it was all for the best.

Patent Intelligence.

Application for Letters Patent.

4586. Eleanor Henrietta White, 186, Fleet Street, London, E.C., for "A new or improved holder for photographic plates."—28th March, 1887.

Official Abstract of Accepted Complete Specifications.

Brown, 6936, 1886. "Stand connected to camera by ball and adjustable socket joint; socket consists of three separate pieces."

Newman, 7155, 1886. "Simplified means for obtaining swing of front and back; central focussing rack; tripod top recessed into baseboard."

Specifications Published.

7121. George Lowdon, 65, Reform Street, Dundee, in the County of Forfar, Optician, for "Improvements in photographic cameras."—Dated 27th May, 1886.

Camera in book form.

5596. Lorentz Albert Groth, K.G.V., Civil Engineer and Proprietor of the Patent Industrial and Financial Agency, 30, Finsbury Pavement, London, E.C., for "A new or improved process for preparing the negatives required for reproducing photos in copper-plate, lithographic, or printing presses." (A communication from abroad by Louis Collardon, Captain, of 1204, Cordoba, in the City of Buenos Ayres, Argentine Republic, South America, and Albrecht Edward Barthel, of 111, Liberty Street, New York, U.S.A.—Dated 22nd April 1886.

The claim is—

A method of preparing the negatives required for reproducing photos in copper-plate, lithographic, or printing presses consisting in fastening on a smooth, level surface, grains of wheat, rye, lentils, beans, rice, barley, sand, or other suitable material, or a design suitable for the purpose, and from which plate a photo on a very reduced scale is taken having a corn surface by means of which in conjunction with half tone originals corn negatives can be produced, substantially as hereinbefore described.

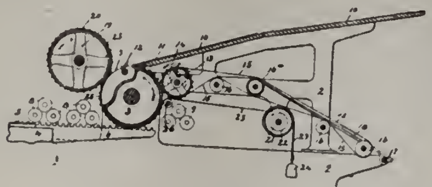
5654. Lorentz Albert Groth, K.G.V., Civil Engineer and Proprietor of the Patent Industrial and Financial Agency, 30, Finsbury Povement, London, E.C., for "A new or improved process for preparing the negatives required for reproducing photos in copper-plate, lithographic, or printing presses." A communication from abroad.—Dated 24th April, 1886.

The claim is—

The preparation of negatives for reproducing photos in copper-plate, lithographic, or, printing presses, consisting in preparing plates or cylindess with peculiar corn or irregular surfaces on which an uncoloured transfer paper prepared with chalk is pressed, the impressed copy of which in conjunction with any negative serves for producing a positive with a corn or irregular surface, by means of which the plates can be produced as described in our former patents, Nos. 5595 and 5596 of 1886.

Patents Granted in America.

358,661. John T. Hawkins, Taunton, Mass., for "Alberttype-printing machine." Filed Sept. 16, 1886. Serial No. 213,707. (No model.)



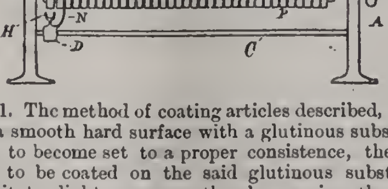
Brief.—Prints from Alberttype-plates, and interposes at every impression a mask-sheet, through openings in which the impression is made on the sheet to be printed, which is protected at all other points. Two distinct sets of inking rollers are used, each supplying to the plate an ink of different quality and consistency one of which acts to dampen the plate.

Claim.—1. In an oscillating-cylinder printing-machine, in combination with its impression-cylinder, a frisket or mask-sheet held in contact with the exterior surface of said cylinder and operated by mechanism, substantially as described, whereby it is caused to move in unison with said impression cylinder in both directions, as and for the purposes set forth.

2. In an oscillating-cylinder printing-machine, in combination with its impression-cylinder, a reel cylinder, as 19, geared to said impression cylinder, so as to have a surface velocity equal therewith, a reel-holder, as 21, actuated as described, a suitable leading-roller or rollers, and a frisket or mask-sheet secured at one end to said reel-cylinder and at the other to said reel-roller, whereby said frisket or mask-sheet is held in contact with the under surface of said impression-cylinder and caused to move in both directions in unison therewith, substantially as and for the purposes set forth.

3. In an oscillating-cylinder printing-machine, the combination of an oscillating impression-cylinder, as 3, carrying grippers as 12, a reel-cylinder, as 19, geared thereto, so as to have equal surface-velocities therewith, a reel-roller, as 21, a frisket or mask-sheet, as 25, secured at its ends to the said reel cylinder and roller, a sheave, strap, and weight, as 22 23 24, upon said reel-roller, a delivery cylinder, as 14, carrying grippers, as 13, suitable conveying tapes or cords, as 15, and an oscillating fly, as 18, whereby when, the sheets are fed to said grippers 12, said sheets are automatically taken between the impression-cylinder and frisket or mask-sheet, there held while being printed upon, and automatically delivered upon a suitable receiving table, substantially as and for the purposes set forth.

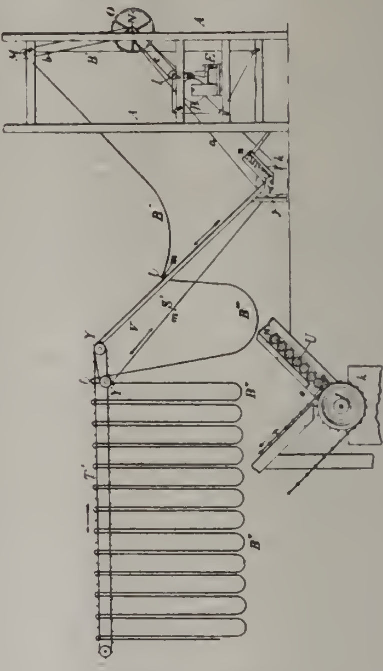
358,849. Albert Edwards, Brooklyn, N.Y., "Apparatus for coating surfaces."—Filed June 26, 1886. Serial No. 206,329. (No model.)

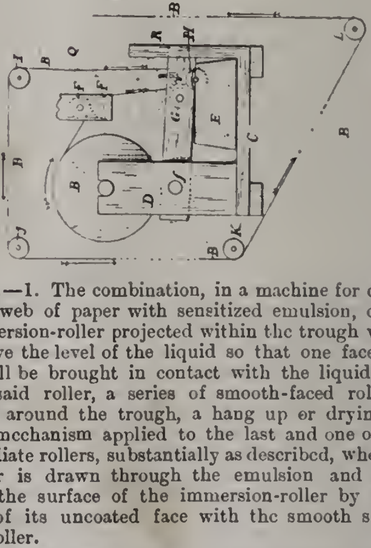


Claim.—1. The method of coating articles described, consisting in coating a smooth hard surface with a glutinous substance and allowing it to become set to a proper consistence, then placing the article to be coated on the said glutinous substance and subjecting it to slight pressure, thereby causing the rough or uneven surface to be pressed into the soft glutinous substance, which slightly enters the texture and adheres to it, then stripping the article from the surface, carrying with it the glutinous substance, which forms a smooth glossy coating on the under surface of the article so treated, as set forth.

2. In an apparatus for coating surfaces, the cylinder B, provided with rib P, groove S, and the means for guiding the article to be coated on to said cylinder, substantially as and for the purpose set forth.

358,848. George Eastman and William H. Walker, Rochester, N. Y., assignors to the Eastman Dry Plate and Film Company, same place, "Apparatus for manufacturing sensitive photographic films."—Filed October 25th, 1884. Serial No. 146,449. (No model.)





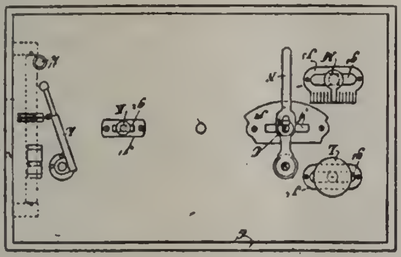
Claim.—1. The combination, in a machine for coating a continuous web of paper with sensitized emulsion, of the trough, the immersion-roller projected within the trough with its upper face above the level of the liquid so that one face only of the paper will be brought in contact with the liquid when drawn around said roller, a series of smooth-faced rolls disposed at intervals around the trough, a hang up or drying frame, and driving mechanism applied to the last and one or more of the intermediate rollers, substantially as described, whereby the web of paper is drawn through the emulsion and held pressed against the surface of the immersion-roller by the frictional contact of its uncoated face with the smooth surface of the driven roller.

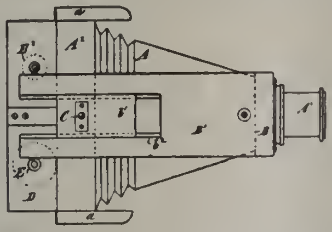
2. In an organized machine for automatically coating a continuous web of paper with a sensitized emulsion, the combination of the following instrumentalities: supports for the roll of paper, a trough for containing the sensitized emulsion in a fluid condition, a roller with its lower surface immersed in the trough and around which the paper is conducted to bring one face only in contact with the emulsion, a series of smooth-faced supporting-rolls for sustaining the coated web and holding it under tension while the coating is setting, said rollers arranged to make contact with the uncoated surface of the web and to conduct the latter around the supply-roll and coating-devices, driving mechanism for rotating one or more of the series of smooth supporting-rollers to effect the feeding of the web, and a hang-up or driving apparatus upon which the coated paper is delivered and held suspended, substantially as and for the purposes set forth.

In an organized machine for making sensitive gelatino-argentic paper for photographic use, the combination of one or more driven smooth-faced rolls for maintaining the coated paper in motion, a suitable hang-up machine, and a coating mechanism consisting of a smooth-faced roll partially submerged in the coating material, said coating-roll being arranged at such a distance from the hang-up machine as to allow the gelatinous coating to set before it reaches the looping-slat, substantially as described.

4. In a machine for coating paper with sensitized gelatinous emulsion, the combination, with the trough and means for heating the emulsion contained therein, of a roller partially immersed in the liquid emulsion around which the paper is drawn, so that one face only will be brought into contact with the emulsion and receive a coating thereof, suitable paper-feeding rolls, and a delivery-roller arranged at such a distance from the trough that the paper is kept continuously in motion until the film has set before delivery to the hang-up frame, as set forth.

357,984. Matthias Flammang, Newark, N. J., assignor to the Scovill Manufacturing Company, New York, N. Y., for "Photographic camera." Filed Dec. 24, 1885. Serial No. 186,621 (No model.)





Claim.—1. The combination, with a camera having rollers for sensitised paper and a movable back by which the rollers are supported, of a box or case wholly enclosing the camera and provided with a slot through which a journal of the roller on to which the sensitised paper after exposure is to be wound protrudes, and another slot through which passes from the movable camera back an extension whereby it can be adjusted from outside the box or case toward and from the body of the camera, substantially as specified.

2. The combination with a camera having rollers for sensitised paper and a movable back by which the rollers are supported, of a box or case wholly inclosing the camera and provided with a slot through which a journal of the roller on to which the sensitised paper after exposure is to be wound protrudes, another slot through which a journal of the other roller protrudes, a pointer carried by the protruding journal of the latter roller, and another slot through which passes from the movable camera-back an extension whereby it can be adjusted from outside the box or case toward and from the body of the camera, substantially as specified.

358,817. Armand Muller-Jacobs, New York, N.Y., assignor to the Universal Colour Company, of New York. "Photograph reproduction." Filed Nov. 27th, 1886. Serial No. 220,095. (No specimens.)

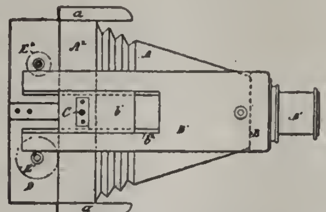
Claim.—1. The process of preparing a hard surface in suitable condition to be etched or for use to yield an impression without being etched, which consists in coating the surface with a solution of a suitable resinate strengthened by caoutchouc or the like, subjecting it in parts then to the action of light, and then to the action of an agent which will affect some parts of the coating more than others, substantially as described.

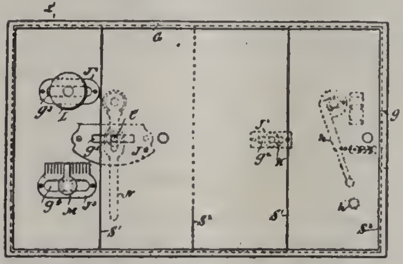
2. The new process of etching, which consists in coating an appropriate surface with a suitable resinate strengthened by caoutchouc or the like, subjecting it then in parts to the action of light, then to the action of an agent which will affect some parts of the coating more than others, and then to the action of an etching substance, substantially as described.

3. The new process of etching, which consists in coating an appropriate surface with a suitable resinate strengthened by caoutchouc or the like, subjecting it in parts to the action of light, and then directly to the action of an etching substance, substantially as described.

4. A reproducing surface composed of a suitable resinate and caout-chouc or the like, substantially as set forth.

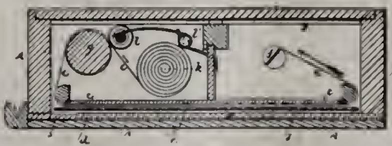
358,942. Henry C. Price, New York, N.Y., assignor to the Scovill Manufacturing Company, same place, for "Photographic camera."—Filed Dec. 24, 1885. Serial No. 186,626. (No model.)

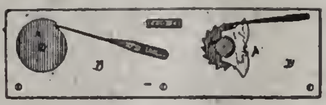




Claim.—1. The combination, with a camera having rollers on which sensitised paper is wound, and a movable back by which the rollers are supported, of an outer box or case wholly containing the camera, and provided with one slot through which protrudes a journal of the roller on to which the sensitised paper, after exposure, is to be wound, and another slot through which passes from the movable camera-back an extension whereby it can be adjusted from outside the box or case, and covers below the bottom of the box or case, substantially as specified.

358,893. Alfred P. Sharp, Dublin, county of Dublin, Ireland. "Photographic camera slide."—Filed July 3, 1886. Serial No. 207,121. (No Model). Patented in England March 20, 1885, No. 3,581.





Claim.—In a photographic camera slide, the frame A B, containing the flat piece of ebonite *c*, with curved ends, the plate of glass *d*, and the sensitized paper *e*, attached to roller *k*, and passing under pressure-roller *l*, over measuring-roller *g*, with indicator *h*, thence between the ebonite *c* and glass *d*, to receiving-roller *f*, with slot *f'*, said roller *f* having attached to it, outside the frame A B, the ratchet *p* and key *p'*, all in combination with each other, and substantially for the purpose set forth.

358,816. Armand Muller-Jacobs, New York, N.Y., assignor to the Universal Colour Company, of New York. "Photography." Filed Oct. 23, 1886. Serial No. 217,063. (No specimens.)

Claim.—1. The new process of photography, which consists in coating a suitable surface upon which it is desired to produce a photograph with a solution of a resinate of a metal or of an organic base, subjecting the prepared surface then to the action of light, as described, and then to the action of a suitable agent to obtain a negative or a positive of an object, as desired, substantially as set forth.

2. In the art of photography, the employment of a resinate as the essential sensitizing medium, substantially as and for the purpose set forth.

3. As a new article of manufacture, a resinate photograph substantially as described.

◆

ALPHA PAPER.

BY G. DAVIDSON.*

The question has been asked, and by a photographer, too, "What in the world is Alpha paper? Is it a curl-paper or a young ladies' journal?" It is neither of these, nor must it be confused in any way with the ingenious clothes-wringer and other articles of commerce blessed with the same arrogant title. It might be explained to some that this title gives no clue to its composition. The name is intended to be understood as that of a photographic printing paper which claims to be registered A1, or as easy to work as A B C.

It is a rapid printing paper for obtaining positives by artificial light, and is subjected to much the same treatment in development as the argentic bromide papers. But it appears to have important points of difference from these, and, as in working, it shows such remarkable resemblances in behaviour to some of the well-known characteristics of the ordinary albumenised silver prints, it is generally described as a chloro-bromide paper. Others may be able to throw some light on this point.

Its first introduction was in 1884, and in some quarters it was hailed as a boon and a blessing to photographers. In one of the photographic papers it is remarked, "The inauguration of this process may be regarded as being almost as great an era in the history of photography as the introduction of dry plates."

These expectations were not, however, realised, and no further mention of the new material is to be found in the same journal for some years. At that time difficulties in working must have presented themselves, or the popular fancy had not yet been educated to admire photographs in black and white or monochromatic prints in warm colours other than those with a glazed surface. As illustrating the poor favour which it met with at first, many amateurs are still found having in their possession the unused remains of small packets which they purchased in the early days. Latterly, through improvements in manufacture possibly, it has come to the fore again, and for some time there has been a growing revival of interest in it. This meeting of rival enthusiasts is one of the signs of the change. Whether alpha paper merits the brilliant future anticipated for it in the journalistic allusion already quoted, or not, there is a very general opinion held that on account of colour obtainable, latitude in exposure, sensitiveness to artificial light, and marvellous cheapness, it deserves to be better known and more widely used than at present is the case.

Those who have had experience in the treatment of the ordinary bromide papers will require very few directions or warnings in regard to the use of alpha paper. An exposure somewhat more protracted is required than with bromide papers; the same cleanliness in the manipulations must be observed; iron development, or, if very careful clearing is attended to, alkaline development, may be employed. Next, an immediate application of acid and alum clearing solution, followed by washing, and, if thought necessary, toning in a gold or gold and platinum bath; then the usual fixation, varied in length of time in certain cases, according to the colour (warm or cold) required; and, finally, a thorough washing in several changes of water.

In regard to developers, the formula given with the paper works exceedingly well, but as oxalate of potash and sulphate of iron are generally kept in saturated solutions, directions should be given simply to make the required formula from these stock solutions, instead of putting each operator to the trouble of making the necessary calculations for himself. For the sake of any who have their oxalate and iron in saturated solutions, and may wish to be spared the trouble of mixing a special developer, the following directions may be given:—

No. 1—Oxalate of potash (sat. sol.)	2 ounces
Bromide of ammonium (10 per cent. solution)	... 60 to 180 drops
Water	½ ounce
No. 2—Sulphate of iron (sat. sol.)	½ ounce
Citric acid	10 grains
Water	3½ ounces

For development take equal parts of each; the iron *must* be added to the oxalate. If larger quantities are required, of course multiples of the above must be taken. The bromide must be varied to suit circumstances. The citric acid can be put in by guesswork.

This developer is weak and well restrained, and the object of this is to make more certain of producing a warm colour in development, and thus to avoid the somewhat unpleasant greenish colour apparently given by some negatives under a short exposure and stronger development. A clearing solution may be made by taking from 10 to 12 ounces saturated solution of alum, adding 10 ounces water, and ¼ ounce of citric acid.

After washing, a toning bath, if one be required, may be used. That recommended in the directions with the paper, any acetate bath, or a bicarbonate are found to work equally well, but more chloride of gold will be found to be required than in toning ordinary silver paper. But in many cases toning can be dispensed with.

The fixing-bath should be hypo 1 to 4, used fresh. If much stronger than this, blisters appear. The toning and hypo baths are used mixed by some workers. The results are much the same.

Very good prints again have been obtained by the use of pyro-potash, pyro-soda, and pyro-ammonia developers somewhat weaker than as used for plates, and with a large quantity of sulphite of soda or citric acid. With these developers clearing solution should not be stinted. Stains which five or ten minutes in the acid and alum fail to remove will sometimes disappear if the print is left in for a much greater length of time, and the picture seems in no way to suffer.

Others may have tried hydrokinone and other forms of development. Their experience will be interesting.

But by far the most important feature about alpha paper, and the most interesting subject to treat of, is the variation obtainable in regard to colour. Warm colours are to be secured by using other well-known printing-papers. Platinotype of a special kind gives a beautiful brown tint. Bromide paper by special treatment will give a colour approaching sepia; and nothing can exceed in range and variation the colours which autotype yields; but it is a distinct gain to be able to secure a similar result upon a paper which can be printed by artificial light, and which can be obtained at a cost below that of ordinary silver paper.

The power to vary the colour of a print from any particular negative is held to be of great service. Without going the length of asserting, as has been suggested, that the cold, grey colour should be kept for cold and wintry scenes, and that prints in warm monochrome should be used for summer sunny scenes, still there can be little doubt that much can be done by a judicious suiting of colour to subject. There are certain fine enlargements of sea and shore waves done in shades of green—well known to most photographers. This treatment is felt as yielding a not unpleasing effect. To apply the same to portraiture would, perhaps, hardly give the same satisfaction.

There has been a rush for black-and-white in late years, and we have even been told that the warm colours of ordinary silver paper are held to be most objectionable by artists and men of cultivated taste. If not too assertive, the simple answer is to say that this is a mistake which a wider experience, better judgment, or closer observation—in fact, a more cultivated taste itself—would have obviated. No doubt, the glaze of silver prints is felt to be fatal to artistic quality, and there is also a widely-spread feeling of approval, and a newly-discovered feeling of delight, in the public mind at having its portraits so like engravings; but, as regards colours, a glance at any gallery of etchings and engravings will indicate the feelings amongst artists, and afford illustrations of lovely pictorial effects enhanced by a rendering in warm monochrome.

Practically, in the treatment of Alpha paper, it may be briefly formulated that a short exposure with normal or strong devement will yield grey prints, or, more frequently, prints of an unsatisfactory greenish shade; whilst long-timing (we will, in spite of objectors, call it "over-exposure") will give, with restrained development, prints in warmer colours.

Upon the negative used much of the colour or the particular shade of red, brown, or purple depends, just as in a silver print. Some will give a pinkish purple, others a mahogany red, and some negatives are much more disposed to yield the warm colours than others. It is difficult to arrive at any certainty that the use of different kinds of light—daylight, magnesium, or gas—has any distinctive effects upon colour. Nor is it seen that there is any decided or regular modification by the employment of an alkaline developer in place of iron.

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* Read before the Camera Club.

(*To be continued.*)

Correspondence.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—It is hardly necessary to reply any further to Mr. Debenham than to refer to my previous letter, which explains, as clearly as, I think, is possible, *how to correlate lenses*, and I have succeeded in showing how much simpler the process becomes—no matter what may be the diameters of the stops or focal lengths of lenses compared—when referred to the standard that I have adopted, than to that of the Photographic Society.

Mr. Debenham picks out the case I chose of an intensity $\frac{f}{5}$ and says, correctly, that there is no lens on my list which has exactly this intensity ratio. I may say that I almost intentionally inserted this ratio to show that I had no wish to pick and choose in any way, but simply to demonstrate the general principles involved, in comparing lenses—whether English or foreign—that any photographer may happen to possess.

With regard to the other part of Mr. Debenham's letter, he is simply twisting the question, and attempts to make a simple process appear confusing. To follow the lines he now suggests, in order to compare either different lenses, or one lens with its various stops, absolutely the same process will be gone through (see my last letter), but carried out in a different order. Take a lens of accurately determined focal length, find its working diameter, full aperture, and also take the diameters of the various stops. These quantities divided into the focal length obtained, will give the denominators of the fractions expressing the respective intensities. The squares of these numbers give the relative exposures, and these again, divided by 10 and 16 respectively, give in their turn, the numbers by my standard and that of the Photographic Society.

I cannot recognize the apparent printer's errors by which Mr. Debenham contradicts himself, but as far as I am concerned, I distinctly founded my statement on the numbers of lenses employed which have left this house, for I particularly referred to the A and B portrait series. I think, moreover, it will be allowed that having issued nearly forty thousand lenses of various intensities, I am in a position to form an accurate opinion, generally also, of the intensity ratio of the lens mostly employed by the photographer for work in the studio. On my table of intensities, I give advisedly, the approximate intensity ratios, as the denominators are only taken to one or two places of decimals.*

It is self-evident that whatever standard intensity be adopted as unity, the diameters of the stops *can be* so arranged that convenient numbers will result with reference to that standard, which in its turn, however, has in any case to be referred to the squares of the denominators of the intensity ratios denoting the relative exposures; and as the numbers obtained by my standard *are exactly coincident* with those relative exposures (except in the position of the decimal point), I contend that from a general point of view, it is far simpler for the photographer who has lenses with their stops arranged on different systems by various makers—English and foreign—to refer them all to the decimal standard that I have adopted, than to that of the Photographic Society.

In conclusion, it will be consoling to Mr. Debenham that in publishing a certain method *in connection with the Photographic Society's Standard*, that he did not suggest that standard itself, for although he has come forward to defend it, he has entirely failed in his object; and, furthermore, by italicising the sentence in his last letter: "*it is the diameters of the stops by which we take our measure*," and in comparing lenses in his previous letter, *without the slightest reference to their aperture or diameter* (as I have before pointed out), it is evident that Mr. Debenham's line of argument must fall through, for it is neither by the one measure nor the other that we "take our measure" for comparison, but by the ratio of the diameter of the stop or controlling aperture of the lens, to the equivalent focal length of the lens.

Thos. R. Dallmeyer.

19, *Bloomsbury Street, London, W.C.*

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* The relative exposures from which the standard numbers are derived are exact.

Sir,—I notice that two errors have crept into my last letter. By the one I am made to give $\sqrt{10}$ as 1·326 &c., instead of 1·362 &c., and, by the other, the two fractions $\frac{f}{5}$ and $\frac{f}{4}$ are transposed. It should read that "I believe I shall be considerably within the mark in saying that ten times as many $\frac{f}{4}$ lenses have been manufactured as $\frac{f}{5}$.

No doubt any one interested in the subject would understand which was meant, but it is desirable to be accurate. —I am, yours truly, W. E. Debenham.

SIMPLE MAGNESIUM LAMPS.

Sir,—As the original designer of mechanical lamps for burning magnesium wire or ribbon (see Photographic News, April 29, 1864, page 209), I beg to inform you that there is no need to seek German or Russian work in this particular article, as prominently noticed in your last number, there being a *native* and better made lamp at a lower first cost. All my lamps have *compensating* feed rollers, which the foreign imitation has not; therefore there is a liability for the latter to get out of order, as any mechanician would see on examination. Metal reflectors, unless of a very expensive description, are a positive disadvantage. A piece of white cardboard, as a flat reflecting screen, forms at once the cheapest and best reflector. I enclose a photograph showing all the parts.—Yours, &c., F. W. Hart.

PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Sir,—At the commencement of the present year a circular on the subject of the forthcoming Photographic Convention was sent to the secretaries of all the photographic societies whose addresses had been published. A paragraph in the circular ran as follows:—

> "With a view of making the Convention thoroughly representative, I shall be glad if your President, or one of your members nominated for the purpose, will represent your Society at the committee meeting to be held during the week of Convention."

The intention has been to endeavour to put the Convention upon a firm footing for increased usefulness beyond the "outward and visible sign" of an enjoyable holiday, combined with instructive knowledge derived from the evening meetings. The object is, first, to make the Convention in every respect thoroughly representative.

It must be obvious that a body of this kind, commanding the entire confidence of the professional and amateur alike, would be in a position to effect considerable good. There are many questions not partaking of a legal nature, materially affecting the interests of the photographic fraternity, that could with advantage be discussed by and arbitrated upon by such a body, even if the meetings were held only during the week of Convention. It is unnecessary here to summarise the good and useful work that might be done beyond what I have merely hinted at. I am more immediately concerned now in urging those secretaries who have not already done so to send me at an early date the name of the gentlemen chosen by the members of their societies to represent them at Glasgow in July next.—I am, yours, &c., J. J. Briginshaw.

Albert Road, Walthamstow.

[Societies that have not thought it worth while to accede to our correspondent's request—or almost demand—may be induced to change their views by a perusal of the above. We understand that our correspondent represents the convention that met in Derby last year, and not the annual conference or convention organised by the Camera Club, and reported in our issue of February 11th last. Strictly the former should, we believe, be called "The Convention" and the latter should be called "The Conference."—Ed. P. N.]

Proceedings of Societies.

London and Provincial Photographic Association.

On Thursday evening, the 24th inst., the last Smoking Concert for the Winter season was given under the presidency of the Hon. Secretary, J. J. Briginshaw. There was a full attendance, and an exceptionally good programme was provided for the occasion, in which the following gentlemen took part:—J. Andrews, A. Bell, A. Cerazzi, A. Glover, P. Hembrow, F. W. Jones, R. Keeves, J. Kitchener, G. Leipold, E. Mills, H. G. Prim, F. W. Read, H. S. Starnes, S. Tully, and H. W. Ware.

The proceedings terminated with the usual votes of thanks.

Birmingham Photographic Society.

The usual fortnightly meeting was held at the Technical Schools, Bridge Street, on the 24th instant, W. J. Harrison, F.C.S., Vice-President, in the chair. Josiah Pumphrey was elected a member.

After some discussion it was proposed and seconded that the excursion on August 9th should be to Bridgnorth.

Amongst the exhibits a number of photographs and slides were shown by Messrs. Delicate, Pickhard, Pumphrey, and Tylar, taken during the Queen's visit to Birmingham.

Mr. Welford then gave his paper on the "Humorous Side of Photography."

At the conclusion of the paper, which was very entertaining, the Vice-President, after thanking the Lecturer, announced that the subject of the next paper, on April 14th, would be "Enlargements," by E. H. Jaques.

Photographic Society of Philadelphia.

A meeting of the Society was held on Wednesday evening, March 2nd, with Frederick Graff in the chair.

The Executive Committee reported that they had considered the matter of permitting members to use the room for private lantern exhibitions. After a short discussion, it was decided to grant the privilege.

The paper for the evening, written by Charles R. Pancoast, was read in his absence by John G. Bullock, the subject being "Photographing at Niagara Falls" (see page 198), illustrated by about twenty-five lantern slides taken from negatives made by the writer.

Frederick E. Ives made a short address on the subject of "Photographing by the Aid of the Phosphorescent Tablet" (see page 199) He showed on the screen several photographs, among which was one showing some buildings made by the use of a phosphorescent tablet in the camera, and another in which a metallic object had been photographed by the action of reflected heat rays on the tablet in the camera.

Talk in the Studio.

The Balloon Society.—J. Traill Taylor, Editor of the *British Journal of Photography*, will read a paper on "Lenses," before the members of the Balloon Society, at the Royal Aquarium, on Friday, the 29th April, and the chair will be taken by A. L. Henderson. With reference to this Mr. Taylor writes:—"In your issue of the 25th inst., Mr. A. L. Henderson is reported to have said, at the meeting of the London and Provincial Association, that I was to deliver a lecture on lenses at the Bolton Society on April 1st. Permit me to say that instead of 'Bolton,' the place is the *Balloon* Society at the Royal Aquarium, Westminster, and the time is the last Friday of April."

Farewell Dinner to W. K. Burton.—This took place on Wednesday last at the Holborn Restaurant, W. H. Walker, of New York, in the chair. The Chairman expressed his pleasure in being present at such a large and representative gathering of English photographers, assembled to wish their friend Burton God-speed in his new field of work. He then, in the name of those present, presented to the guest of the evening a chronograph (oxidised steel and gold case) and a gold chain. The gathering was characterised by the utmost good feeling, and indicated a very close and personal regard for the guest; who, in a feeling speech, expressed his appreciation of the good things said about him. The Chairman, in response to a vote of thanks, said that he fully appreciated the compliment paid to American photographers in asking him to preside. It is understood that Mr. Burton leaves for Japan on the 6th instant.

Photographic Club.—The subject for discussion on April 6th will be "Portable Tents, and Plate-Changing Contrivances." The Bank Holiday outing will be to Radlett. Trains from Moorgate Street and St. Pancras.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

⁂ Our Publishers desire us to state that next Friday being Good Friday, the News will be published one day earlier than usual. Advertisers please note.

R. P.—1. So entirely a matter of personal feeling that we hesitate to express any view. 2. Tin-plate is not a very suitable material, as the tin soon disappears, leaving the bare iron. Copper will answer very well. 3. Weak acetic acid—one of glacial and ten of water—will dissolve it; but the action must be watched very carefully. Pour off the acid immediately you see any indication of blistering. 4. In a few weeks.

W. L. C.—1. The two solutions, No. 1 and No. 2, may be mixed together, and, if preserved from contact with the air, may be kept indefinitely; but each use of it, and each exposure to air, will weaken its action. 2. The tartaric acid is mainly to prevent the deposition of the iron.

J. C. H. B.—We do not think that you will be able to buy it in this country.

Brighton.—There are no further particulars available, excepting such details of manipulation as would be known to persons working the process in its ordinary form. Numerous articles giving these details have appeared in the Photographic News.

Oscar Scholzig.—We cannot tell you who is the agent for it.

John Gray.—Mix one part of carbolic acid (phenol) with twenty of water, and sponge over with this. Afterwards dry with a soft cloth.

William Coles.—1. This is a matter concerning the publishers, and your letter has been handed over to them. 2. Thank you for the suggestion, of which we may be glad to avail ourselves.

W. Potter.—You are quite right—the matter is a very easy one.

M. P.—The name is strange to us, and we have looked into several dictionaries without finding it.

E. G. Wood.—Thank you for the pamphlet. The former edition was reviewed a short time ago, and what we said in favour of it applies equally to this edition.

J. C. Fowler.—You can only estimate the exposure by preparing plates and making experiments, as numerous circumstances influence the sensitiveness. The quality of the gelatine, the amount of bichromate used, the rate of drying, the age of the plate, and the hygrometric condition of the film at the time of exposure are the main circumstances which influence the exposure. Speaking very roughly, the time of exposure will be about the same as that required to make a print on albumenized paper. With a tolerably constant source of light—as a steady electric lamp—it is quite easy to do without the actinometer.

W. Arndt.—When we get facts suited for publication we shall publish them.

Walter L. Nash.—1. You had better write to the Inspector at the district Police Station. 2. Without seeing the negative we can hardly judge of its quality, but its size is certainly not what you have paid for. 3. The letter has been handed to our publishers, the control of advertisements being entirely in their hands.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1492.—*April* 8, 1887.

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PHOSPHORESCENCE OF GELATINE EMULSION.

Several years ago we alluded to the fact that we had noticed a dry gelatino-bromide film to become phosphorescent when rubbed with a hard body. We pointed out that in some cases this light fogs the particular part of the film concerned. Since that time numerous observations of a similar kind have been made, and phosphorescence has been noticed as taking place at several stages of the work of the gelatino-bromidist; one of the most curious instances of this being a faint phosphorescence which has been noticed when a plate, after having been developed with pyro developer, is immersed in an aqueous solution of alum. The phenomenon of phosphorescence has been alluded to and discussed by Perrot de Chaumeux and also by Londe at a meeting of the French Photographic Society at Paris, and the result was the same whether ammonia, soda, or potash was used as the alkali in the developer; while a recent observation of Chandler, in the United States, shows that the mixture of any one of these developers with alum solution does not cause phosphorescence: that is to say, the production of light is essentially dependent on the gelatino-bromide film.

Eder, writing in the *Correspondenz*, says that he has repeatedly noticed phosphorescence when the plate, which has been developed in a pyrogallic developer made up with soda or potash, is immersed directly—that is to say, without being rinsed—in a saturated solution of alum; but although the phosphorescence then occurs very frequently, it does not invariably occur. Eder never could trace any fogging action as the result of the phosphorescent light.

Eder points out that one must not attribute the phosphorescent light to the immediate consequence of an electric action, but that it is probably rather analogous to numerous other cases of light production during chemical actions in the wet way; as, for instance, the production of light when white arsenic crystallises from its solution in hydrochloric acid.

In further relation to the phosphorescence of emulsion, we may refer to some observations made rather over a year ago by W. K. Burton, and described by him on page 34 of our volume for last year, and which seems altogether inexplicable according to any of the notions we have regarding phosphorescence.

"I was about to coat some plates with emulsion, and was heating the latter up preparatory to the process. The emulsion was in a stoneware 'shut-over jar,' that is to say, in a thick stoneware vessel; the thickness of the sides, I should say, was a quarter of an inch or more. The jar was placed in a tinned-iron saucepan—somewhat old and rusty—and the whole was placed on a ring Bunsen burner."

The emulsion was just beginning to melt when Bolas made his appearance on the scene. To hasten the melting, I took a glass rod and commenced to stir the partly liquid mass. Presently I drew Bolas's attention to the fact that the stirring produced a distinct phosphorescent appearance—that a streak of light appeared to follow the motion of the rod. This interested us both, but did not vastly astonish us. I had heard of such appearances before; Bolas had seen them. On looking more closely, however, we made a discovery which *did* astonish us greatly. The appearance of light streaks was not *inside the stoneware jar, but was outside.* The effect of scraping the *inside* of the stoneware jar with a glass rod was to cause a streak of light to follow the point of the rod *on the outside* in the water. This was not observed only once, but each of us manipulated the glass rod and saw it many times."

May it be that in this case the disturbing force inside the jar reproduced itself in another—and perhaps contrary—form on the outside of the jar, much in the same way as electric disturbances are reproduced across an insulator? Common instances of this sort of inductive action are afforded in the charging of a series of Leyden jars in cascade, and by the return shock during atmospheric disturbances.

FUMING PAPER WITH CARBONATE OF AMMONIA.

The advantages of fuming sensitive albumenised paper with ammonia are pretty generally recognised by those who have given the process a fair trial; rapidity in printing, and ready toning being the result. Still there are disadvantages, and when one uses liquid ammonia the smell is often overpowering at the time, and, indeed, there is reason to suppose that the vapours are often decidedly injurious to the health.

The use of carbonate of ammonia, however, gives the advantage without the inconveniences; and we unhesitatingly recommend it in preference.

It is no new thing to use carbonate, as Grice recommended this course about thirty years ago; but of late Prof. Rood, of New York, has called attention to the matter.

All that is wanted is a box that shuts up tolerably well, on the bottom being a few sheets of blotting paper, with coarsely-powdered carbonate of ammonia between them. The sensitive paper is allowed to remain one, two, or three hours in this box. A pad of blotting paper, in which some powdered carbonate of ammonia is included, may be used in the printing frame.

By exposure to air, the ordinary carbonate of ammonia becomes transformed into a nearly inodorous bi-carbonate, and as this salt is nearly inoperative, fresh carbonate of ammonia should be put in the box as soon as the ammoniacal smell becomes so faint as to be hardly [illegible]cognisable.

NOTES ON THE ART GALLERIES.

The Suffolk Street Exhibition.

BY WIDE ANGLE.

Mr. Whistler's influence in the Suffolk Street Exhibition is even more pronounced this year than last. The walls look positively bare, and the effect of the first room is that the decorators have been interrupted in their work of papering and painting in order that a few pictures may be hung. In the large room this impression is lessened by the amber canopy, which cuts off the vast expanse of blankness above the pictures. But whether the result is pleasing to the eye or not, it is pretty certain that a vast quantity of useless work has been weeded out, and for this relief one may be grateful to the new president.

One naturally looks for eccentricity at the Suffolk Street Exhibition. There is, it may be said, less than usual this year, and the pictures which lay claim to this quality are not the best. A. Ludovici Jun.'s "Harmony in gold and flesh tint" (No. 18), representing a ballet dancer semi-nude, and wearing a pair of satin high-heeled shoes in which she is posturing, is certainly eccentric, but it is also unpleasant. The drawing also seems to be faulty, but this may be due to the model, who, if she be a genuine ballet dancer, will not necessarily be perfect in form. P. Macnab's idealistic picture of the "Lady of Shalot" is one of the best things I have seen by this artist. There is no straining after effect, yet the poetry of the subject is conveyed in the tints of the evening sky, and the misty dreaminess of the river. Very clever also is the indication among the rushes of an ethereal form which may be supposed to be guiding the bark in which the lady is lying.

In the north-east room H. H. Cauty has a picture (58) apparently painted with the object of counteracting the tendency towards tertiary tones, affected by so many of the landscape exhibitors in Suffolk Street. It is as brilliant, I might say gaudy, as paint can make it. Nature apparently has had not much to do with the matter. C. Cattermole's "Fugitives" (69) is remarkable for the peculiar drawing of the horse in the background. Photography most assuredly would have represented the animal's legs in a very different manner. J. E. Grace shows several landscapes which are good, but somehow misses the highest point of excellence.

The most ambitious picture in the large room is a sea-piece of considerable size by T. C. Gatch and W. Ayerst Ingram (No. 146.) It represents a wreck off a rocky coast where are gathered a group of spectators. A good deal of pains no doubt has been taken over the sea, which, thrown up in huge waves of foam, is the principal object in the picture; but unhappily one has to "make-believe" a good deal before we can fancy it is sea at all. It is dry smoke, not wet foam. E. Ellis's "Under Flamborough Head (No. 100), which hangs close by, is in perfect contrast to the picture just named. Here the sea is liquid, transparent, and positive water. W. A. Ingram has some small sea-pieces, which are much to be preferred to his effort in partnership. A very striking and unconventional piece of portraiture is Jacomb Hood's "Game and Sett" (103), representing a lawn tennis player. It is in all respects meritorious. Arther Hill's study from the nude, presumably Hero signalling to Leander, is somewhat clumsy in the lower extremities; and C. S. Rickett's notion of the "Death of Abel" (No. 114) is unintentionally comic. Theodore Roussel's portrait of Mr. Mortimer Menpes is fully qualified to be called an eccentricity, since it shows the sitter in evening dress sitting on a chair against a bare expanse of pink background. No doubt it is entitled to be termed "daring" and "original," but whether it is to be admired is another matter.

C. Cattermole's "Revenge" (145) is one of the few pictures in the Exhibition which has a story to tell, and the artist has told it admirably. A man in mediæval dress, holding aloft his dagger, has just thrown a rival over the parapet of a castle wall. The figure of the falling man is not visible, but a feather floating in the air, and a silk scarf caught in a gargoyle, sufficiently indicate what has taken place. In the distance is seen a despairing woman. It is a dramatic and powerful picture.

William Stott, of Oldham, besides a few small pictures of his favourite brown sands, has a picture entitled "A Nymph" (No. 137), the nude figure of a woman lying in a wood. Her hair is very red and very long, her face of the sickly sensuous type affected by Rosetti, and she has a malformation of the left arm. The President has not attempted to startle the public. Most of his exhibits are in his early manner, notably the "Nocturne in Blue and Gold, Valparaiso Bay" (156), "Nocturne in Black and Gold" (158) presumably a reminiscence of Cremorne; and a "Harmony in Grey: Chelsea in Ice" (165). The latter is a very admirable rendering of cold grey, and altogether remarkable. Among the water-colours the most notable pictures are J. Macculloch's pictures of Scotch scenery. T. N. MacLean's terra-cotta busts in the large room should also not escape notice. They are full of the grace and care which distinguish this sculptor's work.

A CHRISTMAS HOLIDAY AT THE CAPE—ON THE TRAMP WITH A CAMERA.

BY C. RAY WOODS.*

Early the next morning, "mine host" (with whom I soon got "hail fellow" on the preceding evening) and myself started down to the river for a swim. Enlivened by a plunge in the cold water and a hearty breakfast, I prepared to sally forth, first taking the trouble to engage a boy; the word *boy* referring here, as it usually does in these parts, to a coloured *man*. We walked straight out of the village or town, and made for a hill commanding a good view of Stellenbosch, going up the ascent at a smart, steady pace; for climbing must be undertaken on the principle that when there is work to be done, it must be pitched into. The view was well worth the climb, the village and surrounding farms laying at our feet, whilst the not far distant mountains made a background well worth in itself obtaining a little souvenir of. Five plates forming a panorama were soon exposed; but, as three of them are still undeveloped, I will pause in my scribbling to finish them now, lest I should omit anything worthy of being recorded on paper. . . . .

Pity I did not write on from my list of exposures! Out of pyro, and it was two days before I could repair the deficiency, whilst my notes and my memory would have served me well enough. I have my five plates developed now with their background of mountain, their farms and vineyards towards the two sides of the panorama, and the town or village of Stellenbosch occupying the centre, with its buildings far too dwarfed to please my fancy. But still there they are. There stands the College where the rising youth of South Africa pursue academical studies—a square building built rather for use than for ornament, and at each side of the central edifice are the two ungainly wings where I presume the students have their "chambers." There, too, is the spire of the Dutch Church, and many a whitewashed wall and thatched roof peers out from stately groves of trees that line the public highways. One fault I find with the plates—and my other distant views suffer from the same cause—the skies are thin; but no matter—photography never lies, oh no! and there are tricks in all trades but ours: a little painting-out will bring those mountains into fine relief, whilst each crag and gully is sufficiently defined to keep the sharp outline from appearing uncanny.

The panorama concluded, I told my boy to take me down the other side of the hill. He demurred, said there was a gully at the bottom, and we must trespass through a vineyard. Gully or no gully, trespass or no trespass—forward! I wanted to emerge on the other side of the town, near to the College. We soon found a safe path to the foot of the gully, and waded through the little stream that ran along the bottom, marched through the vineyard, and emerged into the main road. Could I conscientiously photograph that unarchitecturally-beautiful edifice, the College? Conscientiously, or otherwise, I knew that I must; South Africa would cry shame on me if I went to Stellenbosch and neglected an edifice that is one of its boasted institutions. And, after all, I must confess that I have employed many a plate on an inferior mission.

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* Continued from page 196.

Leaving the College I made my way towards the church with its tall spire, and chose the most suitable point of view. My widest angle lens was called into requisition, and the subject occupied nearly all the plate, my rising front being raised as high as the field of the lens would permit. Not enough. My camera had to be tilted and my swing-back brought into requisition to a very considerable degree, and then my smallest stop was put in. Half an hour was thus occupied, and it was impossible to get everything into focus. I spent fifteen minutes more looking about for a better point of view, but to no purpose. The Church was as much a *bête noir* of photography as far-famed old Chingford Church, or even more so, for the latter I have taken. "But no matter," next time I go to Stellenbosch I will take an almost pinhole stop, and then—"the time will come." At the corner of a square near the church I exposed a plate on some oaks and a pine tree which barely hid an old Dutch house from view, and then turned into the principal street.

The principal street! Fine old houses are there; a good avenue of oak trees lines the road on either side, and offers a most agreeable shade at all times of the day. Along each gutter, well-lined with smooth stones, runs a stream of clear water that supplies each house, and perchance, if the truth be known, is not so sweet as it looks, but carries off a considerable quantity of filth as it passed on towards the river. One or two inhabitants are stirring abroad, amongst them a smug, well-fed parson with the good things of this world as well as the prospect of the good things of the next; but nevertheless the street, the principal street, near midday seems almost deserted. Well may they call you "sleepy Stellenbosch"—no title was ever more fittingly bestowed. And these balconies or verandahs, or "stoeps" as they are called, it was here that the old founders of the place, the Dutch fathers, used to smoke their pipes and dream of the Fatherland they unsuccessfully attempted to imitate in a far different clime. No Dutch burghers are dreamily smoking here now, but on the stoep of one of the houses I espy two dreamy-looking young ladies being dreamily mashed by a corresponding number of dreamy young swains. I stick up the camera and prepare to focus—drat them, they are waking up! putting themselves into attitudes, and practising sweet smiles. Take up the camera, my trusty attendant, and go a little further down the street.

Down the street we went, and my next plate recorded a few old houses, and the trees and conduits peculiar to the place. Then, turning out of the road, I espied a little church, somewhat out of repair, with a bell suspended between two pillars representing the spire. It was the Malay place of worship, as I afterwards found, and occupied my ninth plate for the day. I could not fail here to remark a peculiar look upon the face of the "boy" that carried the apparatus. I had left the big church without exposing a plate, and here I took an edifice that he deemed beneath contempt. Sadly—if I did not misinterpret the look—had I fallen in his estimation, and strange to say I felt to a certain extent humiliated accordingly. Where, after all, was my indifference to public opinion, when the opinion of a "nigger" could thus disturb me?

My stock of plates was now getting very short—only three left. "Where is the old bridge?" I inquired of my attendant, and he speedily led me to a wooden arch (supported at each end by brick piers) which spanned the Erste river. The water flowed sluggishly between the great smooth round stones on which several "laundresses" of the coloured pursuasion were pursuing their vocation, and as they slapped the shirts and sheets on the stones, I began to realize why my linen "wore" out so soon. From two points of view I took the bridge, the wooden railings of which were soon lined with a concourse of small boys, and I doubt not, had my operations lasted many minutes longer, the safety of the bridge would have been seriously endangered. One youngster who carried a tray of strawberries on his head attracted my particular attention, and I asked him if his wares were for sale. The answer was in the negative; but at that moment a half-coloured girl of by no means plain appearance, daintily attired in white muslin, came up to me, and said that I could get plenty of the fruit of the season at her mother's. Whether it was the pleasure of eating fresh-gathered strawberries on a hot day, or the seductive smile of the young damsel that attracted me, I will not venture to say, but I followed her for about half a mile to a small but neat little cottage, and took a seat at a table beneath the trees. I was just in the middle of my second plate of strawberries, and a third was lying yet untouched before me, together with a second glass of milk, when a happy thought struck me. My friends of the Photographic Club think no excursion complete without a group, and on this occasion a group I would have—of one—on my last plate. So I showed my "boy" how to take the cap off and on, focussed the subject, or rather the table, drew the slide, sat myself down, picked up the biggest strawberry between my thumb and forefinger, opened my mouth as about to receive it, and told the boy to proceed. He did. But instead of putting the cap on again as soon as he had taken it off, he waited, open-mouthed, as myself, for further orders. Five, ten, fifteen seconds, the plate being frightfully over-exposed. I tapped the fingers of the hand least exposed on the table, but with no effect. Twenty seconds passed.

"Shut it up, you fool!" and the fool did. It took me almost all I knew to get anything like a result out of that much over-exposed plate, but what I did get was enough to apprise my English friends as to how I spent my Christmas holidays.

As for my pictures, I developed most of them with success. Some, it is true, might have been taken anywhere, and are common-place and home-like (so the reader would think), but I like them the better for that. Others are sufficiently charcteristic of South Africa. Either way, I am well pleased with the result of three days' work and pleasure.

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ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.C.S.*

Weissenberger's Cyanine Process.—This process has the advantage that it dispenses with the use of alcohol, and thereby diminishes the risk of spots and streaks, which are somewhat frequent on plates treated by Schumann's method. Moreover, the coloured solution is not a sensitiser, and therefore the plates are not so sensitive to light during the process of preparation. One part of cyanine solution (1 : 400) is mixed with 500 parts of distilled water, and the liquid is repeatedly stirred with a glass rod dipped in dilute acetic acid (1 : 10) until it acquires a distinct red colour. The plates are then bathed in the red solution for two minutes, and allowed to dry in the dark. The acetic acid volatilises, and the cyanine is left in the film. Exposed plates should be developed with old ferrous oxalate solution, but never with that freshly prepared. The results are said to be excellent so far as regards clearness of the negatives and correctness of the gradations. Plates prepared in this way will not, however, have so high a general sensitiveness as plates prepared with an ammoniacal bath.

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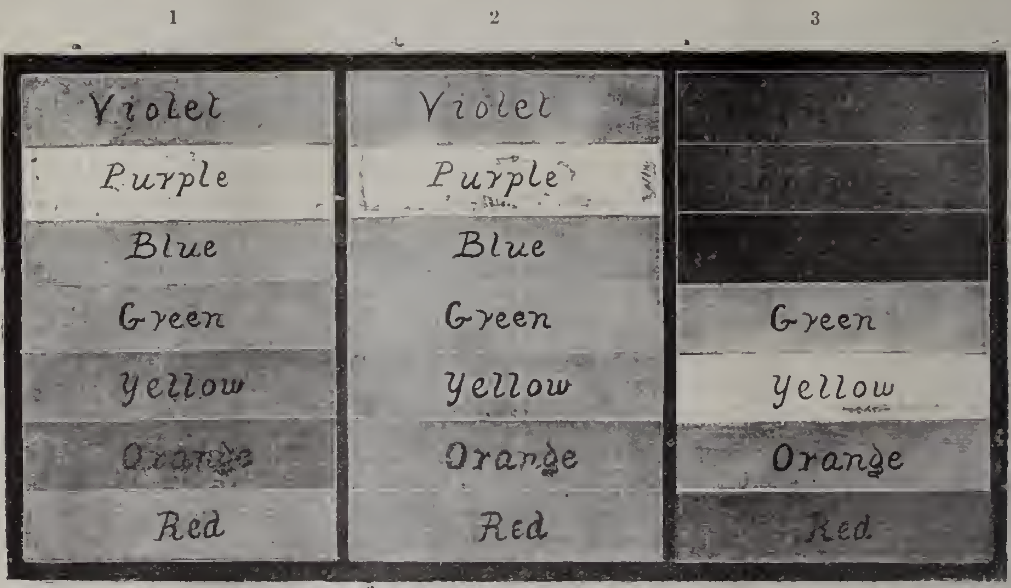
* Continued from page 194.

Mallmann and Scolik's Formula.—The plates are soaked for two minutes in a one per cent. solution of ammonia, and are then bathed for 100 seconds in

Erythrosin, aqueous solution (1 : 1000)	25 parts
Ammonia	4 „
Water	175 „

drained, and dried in the dark. The bath given will suffice for a dozen plates, but it is advisable to add one part of ammonia to both the preliminary bath and the dye bath before immersing the seventh plate. Other dyes may be applied in the same way as erythrosin, and the treatment is applicable to any ordinary commercial plates, provided that they do not contain more than one per cent. of silver iodide. The prepared plates will keep in good condition for several weeks. Exposed plates must be developed with alkaline pyrogallol, since ferrous oxalate tends to produce fog. Plates prepared in this way are from twenty to twenty-five times more sensitive to gas or lamp light than ordinary plates, an effect which is due to the presence of the dye, and hence with a light equal to 250 to 300 candles it is possible to take portraits with a shorter exposure than with a collodion plate in daylight. Details of the suggested methods of illumination will be described subsequently. The plates are two or three times more sensitive to daylight than ordinary plates, an effect which is due to the treatment with ammonia. When a yellow screen is used the exposure required is three or four times as long as when no screen is employed.



Photographs of a scale of Coloured Paper—1. On a Paget xxx plate. 2. On a Paget plate dyed with erythrosin; no screen; same exposure as 1. 3. Similar plate dyed with erythrosin; yellow screen; twice the exposure of 1.

Eder's Formula.—The plates receive no preliminary treatment, but are soaked for two minutes in

Erythrosin solution (1 : 500) ...	2 to 4 parts
Ammonia	1 part
Water	200 parts

and dried. Exposed plates are developed in the ordinary way, but with a somewhat larger proportion of restrainer.

Spitaler's Formula for Stellar Photography.—Bathe the plates for five minutes in

Erythrosin solution (1 : 400)...	4 parts
Ammonia	1 part
Distilled water	200 parts

and allow to dry.

Loscher's Formulæ.—No preliminary bath is used, but the plates are soaked for one minute in either of the following solutions:—

I.—Erythrosin, alcoholic solution (1 : 1,000)	10 parts
Ammonia	1 part
Water	90 parts
II.—Saturated azalin solution ...	4 parts
Ammonia	1 part
Alcohol	20 parts
Water	75 „

If sensitiveness to red is required, No. 2 solution must be used.

*Hasselberg's Formulæ for Spectrum Photography.**—The plates are steeped for about one minute in a weak solution of ammonia, and are then immersed for two or three minutes in one of the following solutions:—

No. 1—From C to wave-length 5600.

Cyanin, alcoholic solution (1 : 400)	2 parts
Ammonia	1 part
Distilled water	100 parts

No. 2—From wave-length 5600 to F.

Chrysaniline solution (1 : 1,000)	3 parts
Eosin solution (1 : 1,000)... ...	5 „
Ammonia	1 part
Distilled water	100 parts

Ives's Process with Collodio-Bromide Plates.—This process, as already explained, consists in the application of chlorophyll, or chlorophyll and eosin, to a plate coated with collodio-bromide emulsion. Up to the present time chlorophyll has not been used successfully in conjunction with gelatino-bromide plates, but some recent experiments by Dr. Maddox† indicate that chlorophyll from the leaves of the tomato or beet may give useful results, and the question is worthy of careful investigation. The chlorophyll solution must be fresh and strong. That from the American blue myrtle or English periwinkle (*Vinca minor*) gives the best results, but that from the leaves of the plaintain answers almost equally well and gives slightly greater relative sensitiveness to red. The fresh leaves are cut up into small pieces, washed repeatedly with warm water, then heated with five times their weight of pure alcohol for about fifteen minutes, and the solution filtered and allowed to cool, when it is ready for use. The solution will keep for a few weeks in a cool place in the dark, but in this case it is advisable to leave the leaves in the liquid, and to add a small quantity of powdered zinc. A plate is coated with collodio-bromide emulsion, allowed to set, then covered with the alcoholic solution of chlorophyll for a few seconds, and finally washed with distilled water until the surface is smooth.

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* *Jahrbuch f. Photographie*, 1887.

† *British Journal Almanac*, 1887, p. 77.

If eosin is also to be added the distilled water used for washing is just tinted with this dye. It is important to avoid the use of too large a quantity of eosin, which would diminish the sensitiveness to yellowish-green.

Exposed plates are developed in a dim yellowish-green light by means of dry pyrogallol, and sodium carbonate and sulphite, with a little bromide. The ordinary stock solutions of pyrogallol do not give good results. In all cases development takes place quickly, and there is a tendency to fog.

It is found necessary to use a yellow screen in order to get the best results, notwithstanding the behaviour of the plates to the spectrum (?), and a tank containing a solution of potassium bichromate (1 : 1.000), or a solution of picric acid, or, better, a glass plate coated with gelatine dyed with picric acid, answers satisfactorily.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter III.—The Air—Ventilation—Combustion—Respiration—Dry Air—Oxygen, its Preparation and Properties—Oxides—Alkalies—Anhydrides—Acids—Salts—Effects of Temperature.

The air forms a very important item in photographic operations. Although it is invisible, it is often inconveniently obtrusive to the out-door worker, being sometimes a positive barrier to his progress; it is essential to the operator in the dark room, but detrimental to the processes he has to carry on. But there is one point that should ever be borne in mind—namely, whenever air is harmful, foul air is more so. All places must be ventilated, but dark rooms, which are generally small, especially require plenty of fresh air, with a minimum of dust and damp. An unventilated or badly ventilated dark room will deteriorate the work done in it by the direct action of the bad air, and also because semi-suffocation dulls the wits of the operator.

Combustion and respiration both work in a similar way to vitiate the air, using up its oxygen, and producing carbonic acid and water. Although these products are heavier than air when they are cold, being hot when liberated they are lighter than the air, and ascend. The accumulation of foul air at the tops of rooms is the key to efficient ventilation; it is from here that it must be drawn off, and fresh air should be introduced at a lower level, so as not to disturb the top layers of unwelcome gases. The higher a room is, the more space is provided for the foul air, and ventilation becomes less urgent. If sensitive material—plates, paper, &c.—must be kept in places where gas is burned and where people breathe, they should never be stored higher than about six feet from the floor, so that anyone walking in the apartments inhales the worst air likely to gain access to the sensitive material. Neglect of these simple precautions has caused considerable trouble to manufacturers, dealers, and photographers.

It is very easy to show that the oxygen of the air—that is, the useful part of it—forms only about one-fifth of the total bulk. The other four-fifths is nitrogen which simply dilutes the oxygen. If a wet medicine phial has a few iron filings introduced into it, and shaken so as to spread over its inner surface, and is then placed in an inverted position with its mouth under water, it will be found that the water will gradually rise in the bottle, until in a day or so it will be about one-fifth full of water. The water that rises into the bottle occupies the space that was filled by the oxygen, and the oxygen has combined with the iron.

Developers absorb the oxygen of the air, especially when they are spread out into a thin layer as they are in developing, and the compounds produced are worse than useless when pyrogallic acid is employed, because they are dark coloured and stain the gelatine. Atmospheric oxygen combines also with ferrous oxalate and destroys its developing power, and, whatever developer is used, a sufficient quantity must be present to allow for loss and deterioration in this way.

The air always contains carbonic acid, normally about ·04 per cent., but this amount is much increased in ill-ventilated rooms. This gas will be subsequently referred to.

The water or moisture that is present in the air often causes the photographer much trouble in other ways than by the leakage of rain through skylights, or their breakage by hail or snow. The amount of the invisible vapour of water in the air is being constantly augmented by the evaporation or drying up of water, whether from wet pavements, clothes hung out to dry, or the surfaces of ponds, rivers, or oceans. We can easily condense enough of the water from the air to get a visible quantity, by means of a cooled surface, such as a tumbler containing spring water or ice. The air that is in immediate contact with the outer surface of such a glass is lowered in temperature and made unable to retain its moisture, which is therefore deposited upon the cooled surface. If a cold lens is brought into a warm room, it will generally be rendered useless for a time by the moisture that is deposited upon it. In such a case the instrument should be left in a warm part of the room for a few minutes, until the moisture has disappeared. Wiping is not a cure, for unless the lens has happened to get warmed during the operation, a fresh deposit of moisture will soon appear.

There are some substances that take up water with such eagerness that they will dry the air they are in contact with, and sometimes become liquid themselves. Carbonate of potassium and chloride of calcium are such compounds. Strong sulphuric absorbs water vapour with greater avidity than either of these salts, but it is obviously not always convenient to use. The paper prepared for platinum printing will give good results only when kept carefully dry, and this is accomplished by storing it in boxes that have chloride of calcium below perforated false bottoms. The chloride of calcium is mixed with asbestos and tied up in muslin to prevent the fine particles from getting on to the paper.

As we have already seen, the air consists chiefly of oxygen diluted with four times its bulk of nitrogen. Oxygen is more abundant than any other element. Besides being present in the air, it constitutes eight-ninths by weight of water, and is doubtless the element present in the greatest quantity in the solid part of the earth's crust. Flints are more than half oxygen. This gas is needed in an almost pure condition for the production of the oxy-hydrogen light, and for other purposes in artificial illumination.

Although the statement reads like a truism, it is worthy of note that oxygen can only be obtained from something that contains it. Chlorate of potassium is the most convenient substance to use, and by mere heat it breaks up into potassium chloride and oxygen. The chemical equation is written thus—

$$KClO_3 = KCl + 3O$$

and signifies that one molecule of the salt yields three atoms of the gas. The weight of the molecule of the chlorate, found by adding together the weights of its constituent atoms, is 122·5, and the weight of the three atoms of oxygen is 16 by 3 = 48. These figures, 122·5 and 48, show the proportion that always exists between the weight of the chlorate of potassium and the weight of the oxygen gas producible from it. The method of discovering the volume of any given weight of any gas will be described in connection with hydrogen.

In preparing oxygen for practical purposes, it is necessary to mix the chlorate of potash with about half its weight, or it may be more, of the black oxide of manganese. The amount of oxygen is not changed by this addition, but its evolution is rendered much more rapid even at a lower temperature. The part that the manganese takes in the reaction is not understood.

It should be noted that neither the chlorate of potassium nor the manganese must be dirty from the presence of ordinary dust or anything that will burn. It is safer to heat a little of the prepared mixture, first in an iron spoon or glass test tube, and if any appreciable sparkling takes place, the mixture must be rejected as dangerous.

Oxygen is a very little heavier than the air. Combustible things burn in it much as they do in the air, but more rapidly, producing a higher temperature because of the absence of nitrogen, and therefore more luminosity. A match with only a spark upon it bursts into flame when plunged into the gas. The artificial light for portraiture invented by J. Y. McLellan consists essentially of a globe that can be filled with oxygen as required, in which magnesium wire is burned.

When substances are burned they are not lost, but new bodies are produced by their combination with oxygen. When the material burned is an element, the product is simply an oxide; and if a compound, such as tallow, wax, or coal, is burned, we may consider that each element is acted upon as if it were alone. Coal, for example, gives carbonic anhydride (or carbonic acid, CO_2) from its carbon, water (H_2O) from its hydrogen, and sulphurous anhydride (or sulphurous acid, SO_2) from the sulphur that may be present. The non-metals, except hydrogen, generally produce, by their burning, substances that are soluble in water and form acids when they are dissolved. Such a compound of oxygen is called an "anhydride." Metals, when they burn, produce what are called "oxides" or "bases," and these, if soluble in water, have properties that are the reverse of the acids. They change red litmus paper to blue, while the acids change blue to red; and they are slimey or soapy to the taste, instead of sharp and penetrating. These properties are termed "alkaline," and are exemplified in ordinary washing soda.

If an anhydride and a base are brought together they generally combine, and the distinctive properties of both are lost in the compound which is called a "salt." Sulphuric anhydride, SO_3 (which can be produced from sulphurous anhydride, SO_2, by adding more oxygen), will combine with the oxide of sodium to form the salt called sodium sulphate (or sulphate of sodium, or sulphate of soda). The salt has none of the properties that are usually associated with acids or alkalies, and its characteristic taste is referred to as "saline." The change that takes place during its production in this way is expressed chemically thus:—

$$SO_3 + Na_2O = Na_2SO_4$$

If we use the acid—that is, the anhydride plus water—instead of the anhydride, the water involved is eliminated as the salt is produced:

$$H_2SO_4 + Na_2O = Na_2SO_4 + H_2O$$

And if, instead of the oxide of the metal we use the compound produced by adding it to water—that is, its "hydrate" we have this water also eliminated.

$$H_2SO_4 + 2NaOH = Na_2SO_4 + 2H_2O$$

There are some acids, such as hydrochloric aid, HCl, that have no oxygen in their composition, and that therefore cannot be built up of an anhydride and water. But all acids agree in containing hydrogen, and if we speak of a salt as an acid with its hydrogen replaced by a metal, we have a description that is universally applicable.

Every salt can be made to furnish an acid and a base. All salts are not neutral to test paper. Carbonic acid, for instance, is so weak an acid that it cannot neutralize the alkalinity of the soda when it joins with it to form sodium carbonate. This compound, however, is none the less a salt, for it has its acid and its base.

An acid and a base can very rarely exist side by side; they will combine to form the corresponding salt. If we add citric acid to restrain, an alkaline developer, we have not simply added a restrainer as when bromide of potassium is added, but the acid combines with some of the alkali to form a salt, that is, a citrate, and we have lessened the amount of free alkali as well as introduced the restrainer. But two or more acids or two or more alkalies can exist side by side, each as if the other was not present. The notion that birds of a feather flock together has no application in chemical changes.

Referring back to our experiments on combustion, we see that a rise of temperature is conducive to chemical action, and that the converse is also true—chemical action generally leads to a rise in temperature. Whatever warming effect we desire is produced by chemical action, as in the combustion of ordinary fuel. But we are apt to forget that the chemical changes we need to bestow the maximum of care over are accelerated by a rise of temperature. Toning may scarcely proceed in the winter time until the solutions are warmed, and developers that are well suited for the average English climate must be weakened or more restrained in the hot weather or in a tropical country. An even temperature in the operating room all the year round is not only a comfort to the operator, but an element of uniformity in his work.

THE BIBLIOGRAPHY OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.*

The lists of books on Photography which have now appeared in the Photographic News include 328 titles. Three of these—Seely, 1857; Fowler, 1865; and Seiler, 1878—I now know to be American; and with these we may class "Draper's Memoirs," 1878, although several of the papers which appear therein were specially contributed to English scientific periodicals.

The books by Crawford (1853), Williams (1860), and Waterhouse (1878) were printed in India. These are the only colonial works on photography I have been able to discover. Of other books there are fourteen translated from the French, and five from the German.

The "Photographic Poems" by Spiller (1859) I found, on consulting the British Museum copy, to be a "sell," having nothing photographic about it but the name. The only purposely "funny" book in my lists is Cuthbert Bede's "Photographic Pleasures" (1855); I believe that a well-executed reprint of this amusing little book would have a fair sale.

Looking over my notes I find another record of a book advertised but not published—"Photographic Chemistry," by J. J. Griffin, of the well-known firm in Garrick Street, Covent Garden.

The entry of a book by "J. Scarling" (1859) is almost certainly an error. I copied the title from the "English Catalogue" before I had learnt to mistrust that work; it appears to be a misprint for J. Sparling, whose book appeared in that year.

There is one book of which Mr. W. C. Crofts kindly sent me the title which I have not been able to meet with anywhere, and of which neither he nor I know the date, though it must be very early, probably about 1840. The title is "Auto-Photography; A Mode of Reproducing

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* Continued from page 760, vol. xxx.

Drawings, &c., by light, without employing the Daguerreotype." By M. P. F. Methiew (?). Translated from the French by — Meadows. Dublin and London.

Sources of Information.

When I began to study the literature of photography my idea was that in the "English Catalogue" I should find a complete list of all the books on the subject which had been published in the United Kingdom, but in this I was wofully disappointed. The "English Catalogue" is published annually by Sampson Low, at the price of five shillings, and it is supposed to include the titles of all books published in the United Kingdom for each year, these being arranged (*a*) under authors' names, and (*b*) under subjects. Its publication dates back to 1837, thus including, practically, the photographic era, which we usually reckon as commencing with the publication of the discoveries of Talbot and Daguerre in 1839. But the "English Catalogue" altogether did not yield me more than one hundred titles of books in Class I., and in studying contemporary literature I frequently came across the titles of books which were not contained in it. These remarks, however, apply more to the past than to the present, and the titles omitted mostly belong to works which, I suppose, would be regarded by the great book-world as "insignificant."

I also examined the catalogues of the fine libraries formed by our leading scientific societies, such as the Royal, the Chemical, the Geological, &c., and found their barrenness in books on photography to be indeed remarkable.

The Educational Library at South Kensington, and the Library of the Patent Office at 25, Southampton Buildings, Chancery Lane (open free, daily from 10 to 10) afforded me many new titles.

But it was the thorough search of a complete file of the Photographic News from 1858 to 1885 that gave me more useful knowledge than any other source. Not only were the "Reviews" of great service, but there were incidental notices and allusions which put me on the track of many a rare pamphlet. I am encouraged to think that I have been fairly successful in my search by the following extract from a letter which I received a short time ago from the Astronomer-Royal for Scotland, Professor Piazzi Smyth—"You must be doing your part most conscientiously and thoroughly in the labour of your choice, to have picked up the notice of my little pamphlet." But I feel confident that there are many readers of the Photographic News who can render valuable assistance if they will compare the contents of their libraries with the lists which have now appeared in these pages, and let us know of any corrections or omissions.

Some Curiosities of Photographic Literature.

Spiller's "Photographic Poems" I have alluded to above, and belonging to the same class we have "English Photographs, by an American" (1869), "Photographs of Familiar Faces, by a Female Photographer" (1878), and "American Photographs, by J. and M. Turnbull" (1859); in all these cases the word "photograph" is used in its literary and not in its scientific sense. Another somewhat misleading title is Antisell's "Manufacture of Photogenic Oils," an American book published in 1859, in which Talbot's word "photogenic" is applied to lamp oil.

When I came across the title—in the *Catalogue of the Patent Office and Library*—of a "Treatise on Heliographic Photography," by C. Palmer, 8vo., London, 1798, I thought I had found a great treasure. But, alas! a copy of the title-page of the book, kindly sent me by Mr. E. W. Hulme, the Assistant-Librarian, soon proved that I had been too sanguine. It reads—"A Treatise on the Sublime Science of Heliography: satisfactorily demonstrating our great Orb of Light—the Sun—to be absolutely no other than a Body of Ice, overturning all the received systems of the Universe hitherto extant." By Charles Palmer, Gent.; 8vo., pp. xii. and 42. London.

I remember seeing, in a contemporary, a suggestion from an eminent photographer, that the sun might derive his light and heat from some distant source; now here is the very theory to suit him. An immense surface of ice would possess great reflective power, and thus the sun—himself cold and glacial—might be to us a second-hand source of illumination and warmth!

Another disappointment—this time arising from a misprint—was "The Complete Photographer," by J. E. Munson (1867); I found it to be a guide to *Phonography*, *i.e.*, shorthand.

There is one book about which I have had some doubt as to whether to include it in my list or not. This is J. F. Campbell's "Thermography" (1883); J. Wakeman and Son, Kensington, 7s. It embraces a series of devices for registering *radiant heat*.

Until recently I did not know that there was an English translation of the curious book, "Giphantie," written in 1760 by the fantastic Frenchman, Tiphaigne de la Roche, a book which contains a sort of prophetic forecaste of photography. The translation was published in 1761, and the title-page reads—"Giphantia; or, a View of What has Passed, What is now Passing, and during the Present Century, What will Pass in the World. Translated from the original French, with explanatory notes. London: Printed for Robert Horsfield, in Ludgate Street."

Catalogues of Apparatus.

Several of the large dealers in photographic apparatus issue Catalogues of their goods which afford much useful information, being sometimes, indeed, guide and price list in one. Among these we may name, in London, Messrs. Wratten and Wainwright, W. W. Rouch and Co., Sands and Hunter, W. Watson and Sons, J. F. Shew and Co., H. and E. J. Dale, J. Fallowfield, Marion and Co., W. Lawley, &c.; and in the provinces George Mason and Co., Edinburgh; H. Newton and Co., Liverpool; Mawson and Swan, Newcastle-on-Tyne; and J. Lancaster and Son, Birmingham

Photographer's Note Books.

I have not looked these up specially, hence I can only name those that I have used myself, all of which are good and useful.

"Landscape Photographer's Pocket Note Book:" Arranged for entry of date, light, process, lens, stop, No. of seconds, time of day, name of place, remarks. Piper and Carter; 6d.

"Burton's Pocket Book for Photographers," including the usual space for Notes, &c., with Tables for facilitating Exposures. Piper and Carter; cloth, 1s.

"The Landscape Photographer's Systematic Exposure Book," with Tables for Exposure, and wedge of cardboard for measuring aperture of stop. Cartwright and Rattray, 28, Brown Street, Manchester; cloth, 1s.; leather, 1s. 6d.

"Out-Door Photographic Note Book;" R. Keene, All Saints, Derby; 1s.

"Note Book of Photography," for the use of Landscape Photographers. J. Gratton, Bakewell; 6d. (This measures only 3¼ inches by 2½.)

Notes.

Artists who send in pictures to the Royal Academy are in a worse plight than the photographers who complained so badly about the damage done to their frames at the last Pall Mall Exhibition. According to one evening paper the *employées* think nothing of walking on the stacks of pictures in order to drag out some particular frame; frequently the pictures are dashed down without the least mercy, and rarely does a frame come back to the artist without showing signs of rough usage. The plain black canvas frames adopted by Jan Van Beers, if not pleasing, have certainly their advantages.

A photographer's advertisement in the *American Lithographer and Printer* is worth quoting, as it indicates a field of work which might be profitably exploited by many photographers in this country. The notice is as follows :—"A. J. Drummond (25 years' experience), General Photographer, 50, Fulton Street, New York, near Cliff Street. Photo-lithographic transfers; photographing on wood, wax, canvas; silver prints for bleaching; negatives for the different processes. Sent by mail. Reverse and non-reverse tintype a speciality. All work cheaply and promptly done. Instruction given in the above processes. Correspondence solicited."

It will be noticed that the above is mainly addressed to the printing trade, and the leading point, the supply of photo-lithographic transfers, is specially worth notice, as the photographer is not often a lithographer, and the lithographer is seldom a photographer; but any photographer might, with a trifling outlay of money and time, make arrangements for supplying tranfers.

Tintypes—or ferrotypes, as we call them on this side of the Atlantic—are specially adapted for use by the lithographic draughtsman or the wood-engraver, as a ferrotype can be made and supplied in so short a time. Generally speaking, reversed ferrotypes are wanted, and the user can trace from these to scale by means of a pentograph. The gelatino-bromide method of making ferrotypes (page 161) is likely to be especially useful to photographers who work for the draughtsman.

The *American Lithographer and Printer*, from which we quote the above advertisement, is a characteristically pushing paper of the American type, and it serves up to the printing trade a great deal of useful matter on the arts and sciences related to printing, and is calculated to lead its readers out of those old grooves into which the conductors of English printing papers seem to imagine that their readers wish to remain.

A correspondent raises the question as to whether a permanent home for the Photographic Society is at all practicable. He points out that W. S. Bird, in his letter in the *Photographic Journal*, writes by no means in a sanguine spirit, while the best prospect he can hold out is that with £1,000 in hand some "combination" might be possible. By a "combination," our correspondent assumes, is meant premises suitable for the monthly meetings, separate from the exhibition gallery, which would be hired when necessary. If such a place be approved, the question is whether £1,000 would be sufficient to cover the extra out-goings? As Mr. Bird says, too much stress must not be laid upon the receipts from the Exhibition. Last year the expenses of the exhibits were £256 17s. 4d., and the receipts £297. Would the balance of £41 be sufficient to pay for the hire of a separate gallery? In other words, can the Exhibition be depended upon to pay for itself, leaving the subscriptions to defray the expenses of the "home"? This would appear to be an important point to settle. The Exhibition, after all, is the backbone of the Society, and, whether it pays or not, it must be maintained. It is this, indeed, which gives the Photographic Society its position, for the other societies, to put the matter mildly, run it very hard, both in the number and interest of the papers read. If a "home" jeopardizes the existence of the Exhibition, then the notion of a "home" must be dropped.

Neat correspondence cards, ornamented with pleasing pictures, in the prodction of which photography has probably played its part, come to hand from Hildesheimer and Faulkner, of Jewin Street. River and sea views, sylvan scenes, birds and flowers, are all represented in the various series.

"The extensive trade caused by the patronage given by the public to coloured photographs is sufficiently proved by the number of establishments for their sale that thrive in the principal thoroughfares of our large towns." This is the beginning of an article in *The Bohemian*, the writer of which endeavours to show that photography, having killed miniature painting, has not replaced painting with an equal substitute, because "it must be acknowledged that such a mechanical art (*i. e.*, photography) almost precludes any real artistic advancement." The author of these two statements is kind enough to admit the value of photography in regard to animal and wave form, but holds that "it is impossible that the photograph can ever supersede the work of art, for the simple reason that the unthinking camera cannot usurp the artist's highest prerogative, that of choosing the best of many subtle and even varying traits of exposure." After this, one need not be surprised to learn that in photography "the deep blue eye comes out in the positive as colourless as skimmed milk," while the "delicate bloom of a youthful skin and the atmospheric tints which soften the lines of age are absent." Surely the ingenuous writer must have based his opinions on observations made twenty-five years ago. He is certainly ignorant of the work of the best photographers of to-day.

The leisurely way in which the law proceeds is very refreshing in this age of express speed. The injunction sought for by S. G. Payne, of Aylesbury, to restrain the publication of a photograph of the Baron F. de Rothschild's house, in the door of which the Prince of Wales is standing, is a case in point. First an injunction for a week is granted; at the end of this time, the defendants, pleading they had not had time to get up their reply, another adjournment for a week is agreed upon. The case was then "mentioned" for the third time on Friday last, when Mr. Ince, who represented the plaintiff, stated that affidavits had been filed by both parties, and that it was impossible to go on without cross-examination. He therefore asked that the motion might stand over.

The Counsel for the defendants had no objection to this course; indeed, by his manner, he did not seem to care whether the case came on or not, remarking that it was "about a photograph—a very trumpery action." "Yes," returned Mr. Justice Kay, quietly, "all actions are, from the defendant's point of view." And so the action in due time will take its place in the cause list, and the usual delays and adjournments will probably be gone through.

A correspondent writes to inform us that in the course of his "meditations amongst the tombs" at Brompton Cemetery, last week, he noticed several cases in which a headstone was adorned with a photograph of the occupant of the grave, in whose memory it had been set up, and suggests that additional interest would attach to the wanderings of modern "Herveys" if such photographic additions were general. It may be doubted, however, whether such a development would be advisable, seeing that too often the excessive gushing superlatives of an eulogistic epitaph would seem additionally fulsome and overdone were the carte or cabinet of the deceased object of this posthumous flattery exhibited immediately above "in his habit as he lived." In looking "on this picture and on this," comparisons more or less odious would certainly be sometimes suggested; and until our "in memoriam" efforts become more severely true and realistic, it will, perhaps, be better not to try to combine with them the outspoken realism of photographic reminiscences of our departed friends and relatives.

The *St. James' Gazette* has been discoursing at great length upon the different varieties of eyes—in fact, going over the same ground which we some time ago touched upon. The only new discovery which our contemporary has made is, that while eyes are more talked about, they are really less observed than any other feature of the face. The reason is, that to most people outline is much more striking than colour. Eyes vary as you look at them in full or half light. The aquiline nose is always the same. Photographs are constantly impressing the same lesson: they repeat the shape, and ignore the colour. We cannot say we agree with the *St. James'*. We believe colour is easier to remember than outline, and certainly impresses the eye first. As to photography making eyes of the same tint, is that the general experience of photographers?

Anybody, says the *World*, who wishes to make himself familiar with the appearance of public personages of every rank can do so by looking into the photographers' shops, and the risk which the said public personages incur of being handed down to posterity only in the pages of the illustrated journals has been proportionately diminished. The *World* evidently has not a very high opinion of the accuracy of journalistic portraits. But those who do not wish to be bewildered by the different aspects under which a face may appear had better stick to one photograph, or they may find themselves beginning to throw doubt on the truth of photography. Both public men and photographers must know this, or why is Lord Randolph Churchill always taken full face, if not in order to show his characteristic moustache? Mr. Chamberlain, to be identified by his eye-glass, is also invariably posed in this position; and Lord Salisbury, again, must perforce look towards the camera, so as to exhibit his beard and bald forehead. Were these gentlemen to be taken side face, would they be recognized? Mr. Gladstone's face is one of the few which makes itself known under any aspect, and, as a consequence, nearly every view, from profile to full face, can be bought.

Reviews.

The Model Dry Plate Maker. A Practical Guide to the Manufacture of Gelatine Dry Plates. By Abel McDonald. Price 1/-, post free 1/2. (*Penrith: A. McDonald, Station Road.*)

We have here a concise account of the essential points in preparing gelatino-bromide dry plates, and to many persons this may prove more useful than a larger manual.

ALPHA PAPER.

BY G. DAVISON.*

It is by variations in length of exposure, and strengthening or weakening development, that the great range between cold-grey or bronze-green and red or brown is obtained. The changes which can be effected by treatment in the toning and hypo-baths seem to depend very greatly upon the colour of the print as it leaves the developer. Those showing the objectionable greenish colour are, in my experience, the most difficult to deal with. By very strong toning and long fixation some of this can be removed, but it changes to a rather cold, bluish colour. A print developed to a red or brown gives no trouble. It can be fixed direct without gold toning, and will retain its warmth; or, if toned and then fixed, it will give any colour from the original tint through to grey.

There is, in my opinion, but one thing to do, and that is to give rather long exposures, and restrain the development. The latitude is very great, but experience with different negatives must teach the best length of time to give. If greatly over-exposed, the red colour in the print is obtained at a sacrifice of brilliancy; but by a judicious use of bromide and dilution, much can be done to avoid green, and to secure warmth without flatness.

The hypo bath is an important agent in producing changes of colour, as well as in brightening up the pictures. Its action does not, however, seem to be regular. Sometimes, by prolonged fixation, it will appear to remove the green colour from a print which has not been toned; at others, even an all-night sitting will have no effect at all. To take the print from the hypo, treat it in the acid bath, and then return it to the hypo, has been found to change the green to a brown; but whether this would always happen I am unable to say. Other treatments have been tried. Intensification with mercuric chloride and sulphite of soda effectually removes green from an untoned print, and changes it to a very pleasant brown; but, unfortunately, grave doubts are entertained as to the permanence of such pictures.

All these different treatments are exemplified in the prints handed round. Most are simply intended to show the general quality of results to be obtained by the use of Alpha paper. Some, as will be seen from the notes appended, are illustrative of the effects produced by the use of different developers, by varying the exposure, altering the light, and the other experiments already referred to. In the preparation of some of those experimental prints, Mr. Seyton Scott has given very kind assistance.

In conclusion, Alpha paper is certainly worthy of trial and discussion. In addition to its own special advantages in regard to colour and cost, it is sure to commend itself to amateurs on account of its suitability for printing at evening, and for enlarging work.

Continued from page 207.

There ought to be no lack of discussion upon such a subject. It is known that some here have been devotedly engaged in experimenting upon the paper; that they have made important discoveries, and have been nursing until now secrets in regard to it.

In treating of this matter an unlimited number of questions are opened up, some of practical working for Alpha-philes, and others involving subtle points for the speculative and the scientific. Our confirmed materialists will rush in with some horribly convincing physiological explanation as to exactly how and why works of art give us pleasure or excite what is called our imaginasion, and we shall learn from our rising and scientific young men why a difference in colour or other quality in our negatives, or the light or heat they are printed in, yields such variations in the resulting impressions; why long exposure and restrained development set up such changes in the constitution of the image as to impart the appearance of redness to it; why and how fixing gives an additional sulphur toning; and the interesting why and wherefore in regard to many other points which those of us who fancy we have a call to art are very much in the habit of "never minding."

Discussion.

Previous to the reading of the paper, the Chairman (W. Asbury Greene) referred to the early departure of W. K. Burton for Japan, and the meeting very cordially supported an expression of hope that a successful future lay before him.

The Chairman also drew attention to some silver prints sent by a country member, R. H. Bow. These had been fixed by ammonia.

H. H. O'Farrell exhibited an ingenious lantern camera, in which a base-board and rackwork were dispensed with, the front being worked out upon hinged rods.

A. R. Dresser said that some prints which he had intensified with mercury and sulphite of soda had not faded after an exposure to direct sunlight for several days. He had used Alpha paper since 1884, and preferred to tone with hypo, gold, and platinum in one solution. He had used all sorts of developers, with results which he proceeded to show to the meeting. Mr. Dresser also showed a useful frame for the purpose of printing-in clouds on bromide and platinum papers, particularly in the difficult circumstances when an oval or other shaped mask was being used.

J. E. Austin then followed, especially in regard to enlarging upon Alpha paper. Some very striking framed enlargements he had recently done were exhibited, the sizes ranging as high as 2 feet by 1½ feet. He said that enlarging had become his hobby horse, and he found Alpha paper the most suitable of any for his purpose. Silver, platinum, and carbon required a solar camera for this work. A half-plate or under was the most suitable size to enlarge from; the smaller lenses gave much greater depth and crispness. The negative should be full of detail. Harshness was fatal to success. The greater the enlargement required, the greater the necessity for a flat negative, because for marginal definition a smaller stop was required; hence there was a loss of light. He used an 8 by 5 Rapid Symmetrical working a F/22, and found it best to focus for the part half-way between the centre of the plate and edge. On a very poor flat negative, smaller stops will improve matters. In cutting such large-sized pieces from a roll of Alpha paper, he laid it upon glass and used a guide. Treated this way, it was not so liable to tear in subsequent operations. For very large work, to make a safe edge to lift it by, he wetted a margin, and turned it over, the gelatine securing this double thickness. The paper expands in the solution; twenty-four inches will expand to twenty-five. As development proceeds rapidly, it is necessary to lift these large prints just before they appear to be developed. He found iron the best developer, as giving purer whites. Pyro and potash were to be used with advantage for chalky negatives. In developing large work, a wide soft brush was useful to keep the print flat. He found it necessary to allow the acid bath to get at both sides of the paper, or markings showed when dry. He found a great variety of tones result from intensification, according as sulphite of soda, carbonate of soda, carbonate of potash, or bisulphite of potash were used after the mercuric chloride. A very much over-developed print could be improved by treating with a very weak solution of bichloride of mercury.

Douglas P. Rodgers considered the paper extremely useful, enabling printing in almost any desired tone by artificial light. A good print could be obtained from any negative, thin or dense. There was the one drawback that the exposure had to be learned anew for each negative. Alpha paper gave, in his hands, better detail and half-tones than the bromide papers. He here showed a number of examples ranging in tone from a black to a bright red, and gave several formulæ to the action of which he ascribed these colours. The same tones were obtainable in enlargements by the lantern using the lime-light, the exposure varying from twenty seconds to three minutes. He agreed that the print always passed through a red stage in developing, but if it had only received a comparatively brief exposure all the detail would not be out until the deeper shadows had assumed the black colours; so that, if the development of such a print were arrested at the red stage, only half a picture would result. On the other hand, given a full exposure, and it was possible, by the use of a suitable developer, to produce black or red tones at will. He had used the mecurial intensifier to obtain warm tones two months ago, and had not found his pictures fade. Provided they were permanent, he considered this a very useful modification of the working, as the process could be performed in full daylight, and the exact colour judged—a thing quite impossible in the yellow light of the developing room. He did not find an acid cleaning bath necessary, the acidity of the developer being sufficient to prevent any staining of the print. The toning and fixing with gold in the hypo he had found rather uncertain in action. Sometimes it toned, and sometimes not, without any apparent reason.

Mr. Davison said there might have been some error in his intensification experiments, as the treated prints had darkened so easily. He did not think that the colours obtained by Mr. Rodgers were traceable to the peculiarities of his developers, to which he ascribed them, but simply to the fact that those developers were strongly restrained, and the prints fully exposed. He thought some of Mr. Austin's enlargements great triumphs, but many of his remarks upon enlarging seemed to be open to criticism.

PHOTO-MICROGRAPHY.

BY W. H. WALMSLEY.*

Thus far the camera. A few brief remarks as to the microscope may not be amiss. Any stand, monocular or binocular, the body of which can be inclined to a horizontal position, may be employed. In using a binocular stand, it is merely necessary to withdraw the prism sufficiently to allow all the light to pass up the straight tube, and thus convert the instrument into a monocular. The eye-piece may be removed or not, as the operator desires, the former plan being the one generally adopted, and producing, so far as my own experience goes, the better results. If the eye-piece is not used, the tube must be lined with some non-reflecting material, as before stated. A mechanical stage is a great convenience and time-saver in centering an object upon the ground glass, but is by no means a necessity; it should, however, revolve in the optical axis of the instrument if possible. A double or triple nose-piece, carrying as many object glasses of different foci, is also very desirable, especially when high powers are to be used, as an object can be quickly brought into its proper position in the field of view under a low power, when, by revolving the nose-piece, a higher one takes its place; and, if the two are properly centered, the object will be found to occupy the same position in the new field of view.

The placing of the object on the stage of the microscope, and arranging it in such a position as to cast its illuminated image upon the centre of the ground glass focusing-screen, are all to be done with camera closed up short, in which position the eye can readily see the image, whilst the hands reach the milled heads controlling the stage and focusing adjustments. But when the bellows are extended a foot or more, this becomes impossible, and resort to some other method of varying the focus is necessary. The plan I adopted at first, and have ever since followed, was the old but effective one, of a strong fine cord placed in a groove turned in the periphery of the milled head controlling the fine adjustment of the microscope, and passing through hook eyes on either side of the camera to its rear, where it is held taut by a couple of small leaden weights. A very slight pull on either of these serves to change the focus in the most delicate manner, and this can be done whilst the eye is fixed upon the image on the ground glass.

I have used the term *ground* glass in connect with the fine focussing adjustment, but merely as a figure of speech. In reality, ground glass cannot be used for this purpose at all, as the very finest that could possibly be made is entirely too coarse to define sharply any delicate microscopic object. Its usefulness is confined to securing a full and even illumination of the field, and the arranging of the object in its proper position therein. These two essentials arrived at, we must abandon the ground surface in favour of something better adapted to giving a sharply-defined image of the magnified object. Many plans for effecting this have been published, but I shall at present notice only the two which I have used most successfully for some years. The first, which is useful for hurried work, consists in attaching to the centre of the ground surface of the focussing-screen, by means of Canada balsam, a disc of thin microscopic covering glass about an inch in diameter. The balsam fills up the minute inequalities in the surface of the glass made by the grinding process, and renders the circle perfectly transparent. Now, if a Ramsden positive eye-piece, or any ordinary focussing-glass adjusted to the thickness of the screen, be applied to the outer side thereof, the illuminated image will be seen clearly defined in this transparent circle with the most beautiful distinctness, when the proper focus is made with the adjusting cord.

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* Continued from page 13.

This method, however, only allows that portion of the object which is in the centre of the field to be seen and focussed upon, whereas it is frequently desirable to go all over the same to arrive at the best average adjustment. For this purpose, I use the following plan, which is so perfect in its results that I can conceive of nothing better: A sensitised gelatine plate, evenly coated, is exposed to a flash of light, and placed in the developing bath a short time, until it becomes somewhat discoloured, or clouded over, but not long enough for it to acquire any density. It is then washed and fixed as usual; after fixing, and a prolonged washing, it is bleached with bichloride of mercury as for intensification, and again washed and dried, when it will be found to possess the finest surface for delicate focusing imaginable. And now comes in the use for the single plate-holder, to which I have before referred.

Slide and back both being removed, the holder is reduced to a mere framework, which is placed in position on the camera, the ground glass screen having been lowered out of the way. The bleached gelatine plate is now placed in the holder (film side toward the image), where it occupies exactly the place that will subsequently be filled by the sensitised plate. The positive eyepiece, or focusing-glass, being now placed against the outer surface of the plate, and the eye applied thereto, perfect definition may be effected by means of the focusing-cords; the proper position of the image upon the plate having been previously secured through the medium of the ground glass.

A few words as to the objectives may not be amiss. For powers including one quarter inch and higher, no special corrections are necessary. I have had most excellent results with the higher powers of very many of the best makers, both American and foreign; and even the cheap French triplet quarters have produced very good work without further correction. But for all lower powers a special correction, to render the actinic and visual rays coincident, becomes necessary for perfect work. The Messrs. Beck furnish all their lenses, from three inches to four-tenths of an inch, with a convex lens of suitable focus, set in the posterior part of the mounting, which makes a perfect correction, and a negative sharply defined as the image seen upon the focusing screen.

The proper illumination of the object is of the first importance, since, if we fail in this, all our other efforts are of but little account. Various sources of light are at our command: the direct rays of the sun, diffused daylight, the electric light in various forms, magnesium ribbon, or the oxy-hydrogen jet, can all be used most successfully by those able to command time and apparatus. But my remarks at this time being intended mainly for the benefit of those who have only their evenings at their disposal, I shall confine myself solely to the consideration of that illuminator procurable by every one—a good lamp, burning coal oil. Any form capable of being placed at a proper height to suit the stage of the microscope may be used, though some are undoubtedly better than others. The one I have adopted, and find eminently useful, consists of a broad flat reservoir with large capacity, carried at any desired height upon an ordinary retort stand, and using a duplex burner, with the flames placed at an angle to the plane of the stage, in order to avoid the dark spot in centre of field, which always results if the flames present their edges to the object slide. The stage of the microscope should be provided with a set of diaphragms of various sizes, the arranging of the object being done with a large opening, whilst the exposure is made with the smallest which will properly and evenly illuminate the field of view. If desired, a condenser can be used to concentrate the light upon the object; but for a long time I have entirely discarded its use with all powers lower than one-fifth of an inch, using the direct rays proceeding from the lamp alone. This gives a more evenly lighted field, and, although the length of exposure is somewhat increased, the resulting negative is better in every way than one made in a shorter time by a strongly concentrated light.

The difference, in fact, is very marked, and I would urge upon every one using lamplight to dispense with all condensers with moderate and low powers. With high powers, however, a condenser becomes necessary, and an achromatic combination of wide aperture, or one of the Abbé form, may be used with the best results. Some operators use blue or ground glass for toning and diffusing the light. In short, the subject of illumination is an exhaustless one, and I shall not attempt to pursue it further at present. Neither can I give any certain rules as to time of exposures. The length of these vary greatly with the nature and structure of the subject, so that every one must learn to determine this for himself, as in ordinary photographic work. Using a given objective, and with the same plates and illumination, I have had exposures vary from ten seconds to five minutes, regulated entirely by the difference in the colour and structure of the subject to be photographed.

Almost any make of gelatine plates may be used, though some possess the qualities best suited to this class of work in a much greater degree than others. Extreme sensitiveness, combined with density and strong contrasts, are desirable, nay necessary, for most classes of subjects. Carbutt's specials and the Seed plates are excellent; but the very best for the purpose I have ever used are the "Diamonds" made by Richardson of Leominster, Mass. They are extremely rapid, developing with great vigor and density, and have a very fine grain, so that the most delicate details are fully shown. And for all delicate structures, especially finely-marked diatoms, I find it much better to develop for detail only, resorting to after-intensification to obtain necessary density. By this means none of the finer lines or markings are obscured by too heavy a deposit; whilst the negative is quite as permanent as those not intensified, if it be first bleached in a solution of bichloride of mercury, and blackened by immersion in cyanide of silver, or a ten per cent. solution of sulphite of soda. Ferrous oxalate or pyro development may be used with equally good results. At first I favoured the former, but of late years have, in common with most others, grown more and more accustomed to pyro, which, with carbonate of soda, has given me results uniform in their success, and of a quality leaving little or nothing to be desired. I use no restrainer excepting the sulphite of soda in solution with the pyro, the resulting negatives being uniformly of a pleasant grey tone, entirely free from the yellow stains so often associated with the use of pyrogallic acid.

For making prints, bromide paper is especially recommended. It can be used in the camera for enlarging or reducing; or be printed by contact, by day or lamp-light, as desired. It renders all delicate details better than albumen, the finished prints need not be mounted, for book illustrations they are perfect, whilst finally I think there can be no reasonable doubt of their absolute permanence. I will submit prints on both kinds of paper for your inspection and criticism; some of those on the bromide, being contact, and enlarged prints from the same negative. The smooth papers, A and B, of the Eastman Co., are recommended, and if a glossy surface is desired, it may be obtained by squegeeing the print upon a sheet of polished hard rubber, from which it will peel off with a glazed surface when dry, as seen in the specimens now submitted to you.

Since the making of transparencies from microscopic negatives differs in no wise from those of other subjects, I shall not detain you in alluding to them further than to repeat that reduction in the camera gives more satisfactory results than contact printing, and that this is the plan I almost invariably pursue, even if the negative be upon a quarter-sized plate.

It adds very greatly to the scientific value of a photograph of any microscopic object, if the exact magnification be measured, and stated thereon. To do this separately with each exposure would entail an expenditure of time and labour that few would care to assume, but if each objective be carefully measured with the camera closed, and also opened to the full extent of the bellows, and notes thereof preserved, it will be an easy matter to calculate the exact amplification used with each exposure. This measurement is very easily made. A stage micrometer ruled in 1-100 and 1-1000 of an inch is placed upon the stage of the microscope, and the image thereof focussed upon the ground glass, where the value of each division is readily determined. I would advise every one turning his attention to this branch of photography to make such a series of measurements at the outset.

As previously stated, any microscope with a joint for inclination of the body to a horizontal position, may be employed in photography; but those having a short tube of large diameter will do better work than those with long ones. It is highly desirable that the rays of light, after passing through the objective, should be allowed to diverge speedily as possible. Where they are confined to the limits of a long tube of small diameter it will be found that only a small circle of light will be thrown on the ground glass when the camera is closed up short, and that it must be lengthened to a considerable extent before the entire plate is illuminated. In order to overcome this objection I devised, some years since, a stand from which the compound body may be entirely removed, and replaced by a cone-shaped tube which flares away from the back of the object glass, allowing the image-bearing rays to diverge at once after leaving the lens. This stand was made for me in the most satisfactory manner, by the Messrs. Beck, of London, and has since done eminently good work, both as a table microscope and as an adjunct to my microscope camera. I have not found it convenient to present it to you in person this evening, but the photographs which I now hand around for inspection, exhibit it very clearly in its dual capacity. It has a mechanical stage, revolving concentrically in the optic axis, and large milled heads control the focusing adjustments, giving very delicate and smooth movements to the same. So satisfactory has it been in all its performances, that duplicates have been made and furnished to a member of our leading microscopists throughout the country. And it may not be amiss for me to add, that the camera I have described has become a recognised instrument of research and experiment in very many of our first laboratories and colleges, and that the demand for it is growing steadily.

Thanking you for your kind attention, I would once more present the attractiveness of this branch of photography, and urge upon you to try it for yourselves.

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Patent Intelligence.

Application for Letters Patent.

4718. Charles Cusworth, 16, Ellington Street, Islington, for "An improved photographic camera."—30th March, 1887.

4725. Thomas Newton Armstrong and George Mason, 87, St. Vincent Street, Glasgow, for "Improvements in focussing arrangements for photographic cameras."—30th March, 1887.

4804. Walter Joseph Coles, 38, Hanover Park, Peckham, Surrey, for "Improvements in slide carriers for automatically centering and quickly changing slides in magic lanterns."—Complete specification.—31st March, 1887.

4808. Charles Sands and John James Hunter, 20, Cranbourne Street, Leicester Square, W.C., for "Regulating and fixing the horizontal or vertical swing of photographic cameras."—31st March, 1887.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

6114, of 1882. S. H. Emmens and another. "Photometry."

Official Abstract of Accepted Complete Specifications.

Winterhoff, 5978, 1886. "Photo-etching: surface coated with asphalt, &c., design transferred and dusted with bronze, &c., exposed, washed, and etched."

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INSTANTANEOUS STUDIES.

No. 9.—The Pastime of the Future.

Tommy (aged eight). Boo-hoo! Boo-hoo-oo!

Mamma. Good gracious, my darling, what is the matter? Has the dog bitten you?

T. No-o, but he won't sit still and let me take his portrait with the toy camera grandma gave me.

M. Is that all? Well, if you promise to be good, I'll sit to you.

T. (*discontentedly*). But I've taken your portrait twelve times, and I want Fido's.

M. Why don't you photograph Clara's doll? I'm sure that won't move.

T. (*scornfully*). What! me photograph a girl's doll? Shan't! there! Sit down, ma; I suppose I must take you, after all.

(*Mama sits down resignedly in the centre of the room.*)

T. (*roaring*). That's just like you, ma. Haven't I told you often and often you must go near the window? (*Mama obeys.*) No, not looking towards the camera. Didn't I tell you I'd made a hole in the wall for people to look at—why, who's covered up that hole?

M. My dear, your papa said he wouldn't have the drawing-room paper spoilt, and so I had to paste it over with a piece of the same paper, which I'd luckily got.

T. All right. Then fix your eyes on that. (*Makes a mark viciously on the wall with a blue pencil.*) Now don't you move, because I want this to be a clipper and beat all the other boys' photographs. There's ten of us got eighteen-penny cameras in our school, and we've started a club. That'll do; you needn't stare at the wall any longer. [*Exit Tommy with dark slide.*

M. (*solus*). I do wish grandma hadn't bought the boy that horrid camera. There's not a minute's peace in the house from morning to night. No one must walk across the room when he's photographing because he says it shakes the camera; and if any of us dare to move while he's taking our portraits, he bullies us dreadfully. He's monopolised half a dozen of the best saucers for developing dishes, as he calls them, and poisoned the cat, the poor thing happening accidentally to drink some shocking chemical stuff. (*Uproar heard below.*) Goodness me, what is that?

(*Enter cook flushed and excited.*)

Cook. Please'm I must give you notice. I can't put up with such goings on no longer.

M. Dear me, cook, I thought you were so comfortable.

C. Well'm, I've got no fault to find with you or master, but that Master Tommy, if he's allowed to do as he likes in the house, I must leave. What do you think he's done now? He won't put up with the coal cellar for a dark room no longer, he says; and he's been to my saucepan cupboard, and turned out all the saucepans on the nice clean kitching floor, and locked hisself inside devilupping as he calls it.

M. (*plaintively*). But why did you let him?

C. Let him! Who's to prevent him? The boy's—begging your pardon'm—gone stark stary mad over that nasty photography. Why only yesterday not a stroke of work did Jane, the housemaid do, because Master Tom would insist upon taking her portrait all the morning sitting on the dust-bin, which they was all failures 'm, and come out all black along of the coal dust I suppose. But I won't stand no more of it, so you'll please take a month'm.

(*Exit cook banging the door.*)

(*Enter Tom whistling.*)

T. It isn't no good, ma. You've moved awfully.

M. I've just had cook here with serious complaints about your behaviour. You really must give up photography.

T. Oh, I know all about it. Just because I wouldn't take her portrait to give to the policeman, she's turned rusty.

(*Mama resolves secretly to burn the camera on the first opportunity.*)

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CAN PHOTOGRAPHY LIE?

BY J. DUBERT.*

But enough of this. It is time to recall my thoughts from imagination's flight, or I fear my patient hearers will wish me to use my wings until I am happily out of sight.

Speaking-tube whistle: "Baby cabinet; be sure you get a good one. Lady says that you have a reputation for babies."

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* Continued from page 38.

Though this is rather an undefined compliment, I feel nevertheless flattered, and consequently cannot very well refuse to please the mother by fulfilling her desire to make it appear as fine and large a child as possible. Oh, dear! as far as I am able to judge through the speaking-tube, the dear's consent has not been obtained. All doubts on the matter are completely removed when the dear, on its way to the studio, propelled by the mother and dragged by the nurse, insists upon indulging in the process of voice strengthening to an extraordinary degree. I meet it with a toy, but in return am met with a slap in the face. However, I am not disabled, so lend my whiskers to inspire confidence. Unfortunately, I have to retreat, but remembering that my reputation might be somewhat at stake, I determine to hasten matters by the suggestion to hoist the dear upon a chair. That being impossible, I try in succession swing, balustrade, pedestal, tricycle, table, and then the floor. This proved to be the safest ground to work upon, for the darling rolled itself into a laughing fit, when, with the help of a doll, a trumpet, a musical box, and a bell, I actually succeed in focussing the little prince, as his mother called him. Little prince, indeed! His only princely qualities appeared to be the way in which he ordered everybody about. I call him a despot.

There now; here was a chance. Dear! dear!

"Madam, you must kindly leave it entirely to me. You spoiled it."

"But I must see the darling's legs."

I saw that too, so I tried again, when, in consequence of the too close proximity of the mother, I obtained too many legs that time. I got six, the baby's in duplicate, and the mother's as well. My efforts to induce the little tyrant to take possession of the posing chair were more successful this time, the mother proudly watching this offspring of affectionate nature's pranks, sitting by its side, a veritable illustration of maternal pride.

Here is the picture, Mr. Chairman and gentlemen. I value it because it constantly reminds me of the lesson it conveyed when I committed the indiscretion to show the negative. With the mother's sudden exclamation that it only wanted Punch the other side, it dropped, accidentally or purposely I know not, but that only was saved. As it was the best expression baby was capable of exhibiting in its present state of existence, it was agreed to print a vignetted copy from the savings. Receiving intimation that Mr. Spark, who brought an electrical apparatus to be photographed, could stay no longer, I had to hasten matters. As the negative of the baby had purposely been taken with a C.-D.-V. lens, and consequently made it appear a bigger child, I had no difficulty to persuade the mother to accept it, and bidding adieu with a secret good riddance, I prepared for the electrical spark—I mean Mr. Spark—who brought the instrument. It was made entirely of brass, of a deep yellow colour, with blue handle and foot. It occurred to me to use an azaline plate. I placed a yellow glass medium behind my lens, but could not obtain a sharp image. I therefore hit upon the plan to pour colour-stained collodion over the back combination of my lens, which had the desired effect. For experiment's sake I then exposed an ordinary gelatine plate through the yellow medium on the same object. It proved to be almost identical with the azaline plate. Subsequent comparisons with stained and unstained plates gave me similar results. Whether it had been forgotten to stain the plates, or whether the stain that rested upon them was that they were only imperceptibly more sensitive to the yellows rays, I will not presume to say. I shall try Mr. Ives's process next.

Having just received a message immediately to come round to a neighbour's house to photograph the dead body of a little girl, and as there are no more sitters in waiting, I undertake the task myself, though I confess my preference for bodies that have as yet not made acquaintance with the unknown multitude that undoubtedly have found that zenith of glory which we, that are left behind, vainly seek in this vale of hope forlorn. Having examined the certificate of death, to guard myself from any such disasters as catching the measles or whooping cough, or transferring the same undesirable maladies to my customers, I proceed to the chamber where the shadow of death hath cast its awful gloom, and where every aspect seems to bear an imprint of *memento mori*, while the heart is uplifted in silent prayer. Here, in the hallowed and mysterious presence of the sweet little innocent, it is indeed difficult to follow mercenary pursuits. Sympathetic chords, in tender melodies, compel me to persuade the bereaved parents not to carry their intention to perpetuate the sad scene further. Nothing avails, however. It must be done. I cause the child to be placed near the centre of the room, whilst I positioned my camera in the corner opposite, nearest to the window, so as to form a right angle. Having arranged the blankets in such a manner as would form a little bed, I altered the position of the Venetian blinds, so as to throw a decided but soft shade on to the face to form the merest point of high-light, and employing a plate possessed of the finest gradations of half tones exposed for the shadows. I only use a reflector in case I am compelled to place the corpse very near the window; but as time of exposure is no criterion, it is always best to use the middle of the room to obtain the softest picture. With regard to position, I take the greatest care not to show the nostrils. I have in this way always managed to produce pictures which were more sleep than deathlike. Here are some of the results. It adds another to the chapter of lies; but who can blame the perpetrator? Ought he not rather to be blamed if he revealed the horrible truth which, with every fond look, would tear open the wound of despair, which by the other means has passed into the healing state of resignation?

(*To be continued.*)

Correspondence.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—A somewhat vigorous discussion has been raised in your columns respecting Mr. Dallmeyer's suggestion for an alteration of the Photographic Society "Standard," the tone of which seems rather to be influenced by some regrettable misapprehension. But this suggestion does, I venture to think, really deserve serious examination on its own merits, as was indeed to be expected, coming from such a source. It was before the present "standard" was adopted, that in your issue of March 17th, 1882, I ventured a few remarks on the subject, in connection with Mr. Warnerke's paper, printed in the preceding number; and not recognising so fully as he, or Mr. Debenham and other approvers of the scheme, the difficulty commonly felt in calculating exposures by the universal formula $\left(\frac{f}{8\ \&c.}\right)^2$ I rather deprecated any further change then the recommendation to engrave on every lens its equivalent focus, and on every stop its intensity in relation to that focus, so that we should, at any rate, have reliable data ready to our hand. Subsequent experience, however, has modified this view, and I now admit, as does also Mr. Dallmeyer, that the adoption of the P.S. standard has facilitated comparative exposures: though I still fear its use must tend to dull that distinct sense of intensity, and of the time of exposure as the square of that intensity, which all photographers should have in their minds, and the want of which would be felt with strange unstamped lenses, or in using single lenses out of combinations, &c. And I would wish now, as I did then, that every photographer, knowing by heart the focus and aperture of every combination of each individual lens in his possession, could thus readily, after estimating the proper exposure with that most familiar to him, calculate that for any other lens and stop judged best for his immediate work. Certainly the idea never occurred to me that by using the square root of ten, instead of an integral number, as a base for the "standard," a numerical agreement between the resulting numbers expressing rapidity, and those obtained by squaring the intensities, would necessarily follow. And it is a pity it was not thought of before.

It is as well distinctly to bear in mind, that for simplifying calculations of this sort, the plan is to throw, as far as possible, all complicated fractions on matters calculated once for all—that thus the simplest numbers may be those to be generally remembered and used. Thus, whether we adopt as the base of our standard the number four, or the square root of ten, or any other number, the calculation for lens and stops to correspond may be performed once for all by the maker, in such a way that the resulting numbers may be made simple with equal ease, however complicated may be the fractions which the maker has to deal with. Nor, in making fresh instruments, is it easy to see how it can matter much what standard is used.

We may quite put aside all comparison of simple numbers with alarming arrays of decimals, in agreement with Mr. Debenham's remark that "a table prepared with any one standard as a base, will (or may) show simplicity of relation of numbers for that base, and complexity for any other. But I cannot quite see with him that a photographer who wishes to correlate the lenses and stops he possesses, must necessarily divide the focus by such an awkward fraction as the square root of ten, instead of by the simple ratio four. For a ready squaring of the intensity in terms of *f*, is the very thing it is desirable that all should familiarly know; and when known, this square is numerically identical with the proposed standard number, requiring only a change of decimal point. And should this be too difficult, then the proposed standard number being a little more than half as much again as the present one—strictly as 8 to 5—it may surely be hoped that the trouble will not be found very serious.

But I do feel it to be a very serious and important advantage, that the correct expression, and its conventional simplification, should be made to agree, as by the proposed standard. With every fresh stop, lens, or combination—as also with any variation of conjugate focus (notably, in copying)—the proper and natural course is to revert to a fresh calculation of the actual or proportionate intensity. (Such reckoning of proportional intensity is very simple—the proportionate distances from stop to plate, with the same lens and stop, is quite enough.) Squaring this gives at once the time we want, and that this square should at once agree numerically with the corresponding standard number, I for one regard as a happy thought. And I cannot but believe that the council would have adopted it had it come before them. I venture to hope it will yet have their serious consideration. And perhaps it might contribute to this if some of Mr. Dallmeyer's brother opticians indicated their views also. The question how far the unity of the present, or of the proposed, standard agrees best with the ordinary maximum aperture of a portrait lens, seems to me unimportant, and to obscure the main consideration. As a matter of fact, every one of three portrait lenses used in my studio—by three different makers, Voightlander, Ross, and Dallmeyer—exceed in intensity with the full aperture, the ratio of $\frac{f}{4}$, Voightlander's and Ross's being both of the Petzval form.

W. H. Wheeler (Oxford).

Sir,—The question of the greater convenience of one or another standard for the rapidity of lenses divides itself into two parts: the one is the facility for rapidly computing, on the field or in the studio, the relative exposure for various lenses and stops, which have been previously marked with numbers indicating their relation to rapidity; the other has to do with the calculations necessary for arriving at the numbers to be placed upon the stops, or for the diameter to be given to the stops to correspond with certain numbers.

Of these two parts the former is the one where simplicity and ease of calculation is of by far the most importance, since this reckoning must be made by the photographer himself just when his attention should be the least distracted from his work, and must be made every time, he operates; whereas the calculations for sizes and number can be made at leisure, and made once for all. Now for this, the most important branch of the subject, Mr. Dallmeyer has admitted the practical superiority of the Photographic Society's standard over that which he himself proposes, since with the latter larger numbers have to be dealt with. The stops once marked there is no division either by ten or sixteen, and any advantage that the decimal system may possess does not come into play.

Now as to the other branch of the subject, the calculation for the sizes for stops to have certain rapidities, or the estimation of the rapidity of stops or apertures already existing, either the arithmetical or the graphic method may be adopted. The graphic method is, as has been long ago stated by Mr. H. Wilmer, and I think by Mr. A. Cowan, far the most convenient and simple for the photographer's use. In the graphic method it is necessary, in the first place, to divide the focus by the number representing the standard division, 4 according to the accepted standard, 3·162 &c. for the proposed one. The after-processes are the same in both cases, with the difference that higher numbers must be employed for Mr. Dallmeyer's standard.

Mr. Dallmeyer has throughout ignored the graphic method, and he has generally assumed the most troublesome part of the arithmetical method, *i.e.*, that of dividing the focus by the aperture, and of squaring the quotient thus obtained, to be already worked out. Now except in the cases of apertures made for some particular standard, the dividend and divisor will generally be represented by numbers running into fractions, and the quotient requires an array of decimals to represent it. This quotient must then be squared, an operation easiest performed by logarithms. Compared with all this, the subsequent division by 10 or 16 is trivial, especially as it only has to be performed once for all, *i.e.*, for getting the number wherewith to mark the aperture.

Mr. Dallmeyer's undertaking to prove the relative number of $\frac{f}{3}$ and $\frac{f}{4}$ lenses in circulation has dwindled down, as I supposed it must, into a statement respecting the lenses supplied by his own establishment. I am fortified in my view as to the much greater frequency of $\frac{f}{4}$ by the opinion of those whom I have consulted as most competent to judge. Anyone who can measure the equivalent focus can form a judgment from the lenses belonging to himself and friends that may come in his way. It will not be at all to the point to find that some lenses have a smaller aperture than $\frac{f}{3}$ or a larger one than $\frac{f}{4}$. The question is, which standard do they most nearly approach.

Mr. Dallmeyer says that I have entirely failed in defending the Photographic Society's standard. That may be his opinion, but can only be accepted as such. I must confess, however, to failure in one particular: I have entirely failed to make sense, grammatically or logically, of the concluding paragraph in Mr. Dallmeyer's last letter.

W. E. Debenham.

THE EXTRAORDINARY MEETING.

Dear Sir,—Your excellent article referring to the extraordinary meeting afforded me so much amusement, that at first I overlooked the business part of it. Until a solicitor friend pointed out to me the libellous nature of the document, I did not realize what large damages, in case of prosecution, might be awarded; but inquiries made satisfied me that the game was not worth the candle, and accordingly I solaced myself with the thought that he who laughs last, laughs best; and furthermore, that a success achieved without failure is not worth having.

To understand the moral victory scored by me at the meeting, which was undoubtedly packed by the opposition, it will be necessary that all readers should be acquainted with the real facts of the case, the publication of which is withheld from public knowledge at present. As I shall, however, shortly have to say a little more about the matter, in some form or another, I will leave facts and time to do their share in the eventual success which is the sure reward of honest and just intentions.—Yours truly,

238, *Mare Street, Hackney, E.*, 4th *April.* J. Hubert.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 31st. ult., A Pringle in the chair.

S. G. B. Wollaston discoursed and gave a demonstration on "Film Photography." He commenced by speaking of the various commercial sensitive films which have in recent years been placed upon the market, and described the special features of each. He passed round a number of film negatives, and prints therefrom, which elicited much commendation from those present. More than one make of film, he said, appeared among the examples shown, and by reference to his note-book, he should be pleased to give accurate details concerning any negative that might draw forth a question. He then proceeded to strip a film from a collodionized glass plate, remarking, as he did so, that it was more convenient to commence at the end of the process. Intensifying film negatives, he certainly could not recommend, as they were always more or less unsatisfactory. A much better plan was to develop carefully, and if sufficient exposure had been given, the resulting negative would be a good one. Speaking of the latitude of exposure permissible with paper negatives, he stated that a short time ago a negative was sent to him for development which had received just eighty times the normal exposure; by soaking the film in bromide solution, and then using a developer diluted with water, and weak in alkali, the resulting negative was in no wise inferior to any that were shown that evening. With regard to the composition of developers, he gave preference to soda and pyrogallol, over that of ammonia, potash, or ferrous-oxalate, and the formula he used differed only slightly from that of the Eastman Co. He did not recommend starting with a full quantity of soda, since more could always be added, and towards the finish a few drops of ten per cent. ammonical solution was often of great advantage in bringing out detail. The formula of the developer was then given as follows:—

No. 1.—	Pure sodic sulphite	6 ounces
	Distilled water	40 „
	Pyrogallol	1 ounce
	Citric acid	2 drams
No. 2.—	Pure sodic carbonate	4 ounces
	Ordinary water	40 „

For use, mix together one ounce of No. 1, water 2 ounces; No. 2 one ounce, and, as a maximum quantity, 5 drops of a 10 per cent. bromide solution.

An exposed portion from a spool of paper was detached and developed. The demonstrator, being unacquainted with the particulars of exposure in this case, used only three-quarters of the full quantity of No. 2 solution; he first soaked the film in water for a few minutes, and then applied the developer. Finding it much over-exposed, a liberal addition of bromide was made, and an excellent negative was the result. Following development, copious washing in a safe light was recommended in order to prevent discolouration, and so obviate any necessity for the use of a clearing solution; but it was pointed out that should the films be allowed to remain in water longer than five minutes, a considerable increase in density would have been gained without a proportionate amount of or any more detail. Fixing followed, and in due course the film was stripped of its paper support. The method of cleaning glass plates with talc, and coating the same with enamel collodion, was also illustrated.

The chair was then taken by **A. L. Henderson**, and a short discussion ensued.

W. E. Debenham raised an objection to drying negatives in a stretched condition, such as those squeegeed on glass would necessarily be.

F. A. Bridge and the Chairman spoke unfavourably of vaseline as an agent for rendering paper films translucent, and the former gentleman advocated dipping such negatives in a mixture of japanners' gold size and turps; when dry the negatives would not only be translucent, but they would be perfectly protected against the action of water or damp silver paper.

The Chairman exhibited a detective camera made by the Scovill Manufacturing Company. It was in the form of a travelling case, the interior of which contained a bellows-bodied camera of Kinnear pattern, a supply of double dark slides, &c. The position of the image could be ascertained either from the top or side, where it was reflected upon a small ground glass screen. Focussing was performed on the principle of the Samuel Lever arrangement, worked from beneath the box. Exposures could be made by means of an adjustable shutter, which was regulated from slow speed to very fast, and also released from beneath.

J. Traill Taylor presented the Society with several prints of W. K. Burton. These were similar to those issued with the *British Journal of Photography* last week, and were distributed among the members.

Liverpool Amateur Photographic Association.

The monthly meeting was held on the 31st ultimo, at the Royal Institution, President **George H. Rutter** in the chair.

The following were elected members:—Captain L. Ching, R. N.; W. J. Davey, G. W. Guy, and H. R. Marsden.

Proofs of the presentation prints for 1886 were exhibited, being 15 × 12 enlargements, executed in carbon by the Autotype Company, of "A Cheshire Lane," by A. W. Beer, and "Doorway at Tabley Hall," by J. H. Day.

George E. Bell, of the Air Brush Manufacturing Company, Rockford, Illinois, exhibited the action of the air brush, and in presence of the meeting executed in five minutes a large head resembling fine crayon work. The facility with which he worked and his dexterity were much admired. He afterwards explained the construction of the instrument, which is very ingenious.

The competition for the lantern-slide prize was then proceeded with. There were five competitors, who had sent three slides each, which were projected on the screen by means of the Society's limelight lantern, the judges being Messrs. Atkins, Boothroyd, and Sayce. The result of the competition was that the set bearing the motto "Black Diamond" were adjudged to be first, and those with the motto "Gone," second. It was ascertained on opening the envelopes that A. W. Cornish was first, thus gaining the silver medal, and A. W. Beer second. The judges also highly commended a slide by Mr. Riley.

The two hundred American slides sent by the kindness of the Camera Club were then exhibited, and excited a great deal of interest, from the novelty, in many cases, of the scenery depicted and the general excellence of the slides.

Some slides were afterwards exhibited, the work of Messrs. Grillon and Faltin; and after passing hearty votes of thanks to Mr. Bell and the Camera Club, the meeting terminated at a late hour.

Newcastle-on-Tyne and Northern Counties' Photographic Association.

A public meeting was held in the lecture theatre of the Literary and Philosophical Society's Institute, Newcastle, on the 11th ultimo, **James Downey** in the chair.

Certain business connected with the exhibition came up for discussion, and it was resolved that a label not exceeding three inches by one and a half inches, containing the title of picture and name of exhibitor, be allowed on the front of each exhibit, also that the Hon. Secretary write to each exhibitor notifying above.

The slides sent in for competition were then shown on the screen, and the **Chairman** announced Messrs. Gibson and Auty as winners of the first and second medals.

The next meeting will be held in the College of Science on Tuesday, the 12th instant, when Mr. Jackson of the Eastman Dry Plate and Film Company, will give a demonstration of the Eastman stripping films.

Camera Club.

The lantern slide exhibition (the last of the session) at the Camera Club, on March 31, was the most varied that has yet been given. There was a crowded attendance.

C. B. Wright sent three sets of slides—views in Norway, pictures in North Devon, and photographs of ruins on the Riviera after the late earthquake. The English series included some very picturesque effects, particularly "A Misty Winter Morning."

F. Dunsterville sent a further instalment of slides of Indian subjects, mainly showing various classes of natives. These excited very great interest.

Mr. **Frith** exhibited a very varied selection, including views of Greek and Egyptian ruined temples and pictures of home scenery.

W. Brooks showed and explained the peculiarities of some interesting work done five-and-twenty years previously; and

Frank Howard made a few remarks on the printing-in of clouds in lantern slides, illustrating his description by the exhibition of some combination transparencies done by Mr. Breeze many years ago, and by a selection of his own work.

George Smith showed a few very fine Woodbury slides of microscopical subjects and general work, and Mr. Gale exhibited studies of picturesque English landscape with figures.

Dr. G. Lindsay Johnson explained a new microscopical attachment for the lantern.

The subject for April 14th is "A Demonstration in Photo-Micrography," by T. Charters White.

Talk in the Studio.

Photographic Society of Great Britain.—The ordinary meeting of this Society for April will not take place on the usual second Tuesday, but on the *third* Tuesday, April 19th.

A Patent Action in New York.—A legal proceeding affecting an important industry was commenced on Monday in Syracuse before Judge Wallace, of the United States Court, by the Eastman Dry Plate Company, of this city, which obtained an injunction restraining E. and H. T. Anthony and Co., of New York, from infringing letters patent No. 358,848, granted March 8, 1887, to George Eastman and William H. Walker, for apparatus for manufacturing sensitive photographic films. A motion to make the injunction perpetual will be argued in New York April 1st. The plaintiffs charge the defendants with fraud and conspiracy in having possessed themselves of the invention through a workman named Cossitt, whom they hired away from the plaintiffs. Just before the injunction was granted, Cossitt had completed a duplicate of the machine, patented by the plaintiffs, for the defendants, which was to have been working this week. The importance of the case may be imagined when it is stated that the machine makes half a mile of the sensitive paper, thirty inches wide, daily, and that it has made a revolution in the photographic art by which paper displaces glass. A peculiar feature of the case is that the defendants had, in a publication issued by them, and known as *Anthony's Photographic Bulletin*, extensively advertised the invention and conceded its originality to the Eastman Company, and had asked plaintiffs to make the photographic paper for them by the machine in 1885. There is no doubt entertained by the attorney for the plaintiffs, George B. Selden, that the perpetual injunction will be granted. —*Rochester Express.*

More about Deadheads, and what a Dead-beat is.—In reference to the note on p. 157 of the present volume, C. R. Pancoast, of Waterbury, Conn., sends us the following. (See also Luke Sharp's letter on p. 173.) "The term deadhead is applied to one who by reason of favouritism or influence receives favours and attentions without any wilful intention on his part to cheat or defraud. Thus, anyone riding in a railroad train holding a pass is called a deadhead, no matter whether he be the president of the road, a member of Congress, a common labourer, or *émployé* of the company—riding to and from his work. A bankrupt is not necessarily a deadhead, but a deadhead may be a millionaire. Telegraph messages sent by persons in authority holding what are known as telegraph passes are always marked "D. H.,' which simply means that they are sent free of cost. Now a dead-beat is one who, by reason of fraud and chicanery, receives benefits either to himself or in goods, without paying for same. This term applies more properly to the parties mentioned in the article. When a photographer asks a person to sit for a portrait and presents him with copies, the sitter is a deadhead, since he receives value (in pictures) without paying for same."

The Limits of Vision.—Our retinal insensibility to the ultra-violet and infra-red rays has been recently discussed by Drs. Fox and Gould in the *American Journal of Ophthalmology.* The sufficient reason for the perception of the so-called "light" rays is because the eye has learned to react to the strongest and most constant stimulus, and to extinguish or exclude those vibrations that would only confuse by their weakness or inconstancy, or that would with difficulty be focussed with the rest. As to the range of vision along the spectrum, the remarkable fact is, not its narrow limits, but its extension. The marvel is that we have learned to see the violet rays at all, when they are so weak. The limit at the red end of the series is thought to be detemined by the great absorption gap in the spectrum that separates the visible from the infra-red rays. It is then asked, how are the invisible rays excluded from stimulating the nerves? and although no satisfactory or final answer can be given, based on experiment, it is made at least probable that they are absorbed by the media of the eye before they reach the retina.—*Science.*

Michael Angelo on Combination Pictures.—The *American Lithographer* says:—"On being shown a painting, beautiful in its whole composition, but copied in all its details, Michael Angelo simply said: 'It is good, but when the trumpet will be heard on Judgment Day, the several single parts will return to the original, and of this beautiful painting there will be nothing left but the bare canvas.'" Had combination photographs been constructed in the time of Michael Angelo, he might have spoken even more strongly.

He could not recognise the portrait.—(Quoted in *Anthony's Bulletin.*).—The *Troy Times* tells the following amusing story of a man who could not pick out the photographic portrait of his own baby. "Don't you know your own baby?" This question was put to a man about twenty-five years old in an up-town photograph gallery the other day. "Well, I know I'm supposed to, but six-months-old babies look so much alike, and this is our first. I'm free to confess that I'm not positive about that being my baby's picture." The photograph was cabinet size, and the photographer was very much surprised that the paternal parent could not recognise it. "It's a perfect picture of the original, whether it's your child or not," remarked the artist. "O, yes, I'll admit it's a good picture, but what I'm in doubt about is whether it's mine. Haven't you got the negative with the name or number on, to make sure? If I should go home with the wrong picture my wife would never let me hear the last of it." The negative was produced and found to correspond with the entry in the book—"Mrs. ——, half-dozen cabinets—baby." The visitor then paid for the pictures and left the studio.

Photographic Club.—Thesubject for discussion on April 13th will be "The Development of Drop-Shutter Plates." The Bank Holiday outing will be at Radlett. Trains from Moorgate Street and St. Pancras, returning from Barnet.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

E. G. G.—1. The problem in this form is not an easy one; but perhaps a shunt-wound dynamo, such as the smaller size sold by Siemens, would answer as well as any; but probably some sort of governor, constructed so as to put in fresh resistance with an increase of speed, would be required. 2. We will write to you.

J. Bassinoer.—The arrangement is very ingenious, but it is very questionable whether there would be sufficient sale for it in its present form to make it worth while to do as you suggest. If you intend to make a profit out of it, the first step is to obtain a patent.

W. J. Anckorn.—It did not come from the town you mention, and had no reference whatever to yourself.

H. C. Van Woerden.—It was only a few weeks ago, but we have not any means of now referring to the exact page.

Thos. Kendrick.—We have posted you a copy of the paper that seems to us most likely to be useful to us.

W. C.—We cannot go so far as you in your condemnation of it, but we agree with you to a great extent.

Riviera.—1. It will do no harm after development, provided you do not leave the plates in for a very long time. 2. The final rinse with fresh water is very necessary; indeed, it ought to be more than a mere rinse. 3. If the paper is the least damp, the negative will be injured. 4. Not if all materials are quite dry. 5. We have had no experience with this make of paper, and consequently cannot say.

Ernest.—There is no book specially devoted to the subject, but some hints may be gathered from back volumes of the News, and from Abney's "Instruction," published by Piper and Carter at 3/6.

A. M. and Wm. Clark.—At the present moment we cannot put our hand on the author's address, but we hope to send it you in a few days.

W. Burns.—We have no recollection of it: what was it about?

H. G.—A list shall be sent.

G. C. Thompson.—We will write.

A. W. Ranken.—As far as our own experience goes, it is a trifle quicker than the plates you mention; but so little that if your paper is of the same rapidity as that we used, an identical exposure will probably serve your purpose. The oxalate developer will answer very well; but in this case we preferred to use pyrogallic acid.

Ignoramus.—1. As ordinarily used by photographers, the words mean precisely the same thing. 2. No, it should be freshly prepared. 3. We do not know. 4. We will communicate with the author.

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FIGHTING AGAINST HALATION.

When, some seven or eight years since, gelatino-bromide of silver plates rapidly made their way in the studio and field, ousting the long-established wet collodion process, it was remarked by one who had peculiar facilities for forming a judgment upon the work produced by a large number of photographers, that the change of process was marked by a great and general falling off in the quality of the negatives turned out. No doubt this observation referred more particularly to portrait negatives, but it might have been made with equal justice with regard to landscape negatives. and it is upon a failing in landscape work, which is still very common, that we desire to speak in the present instance.

The failing referred to is that which arises from what is known as halation, and is caused by light passing through the film, and being reflected from the back of the plate. This light, being diffused by the translucent but not transparent film, and having to travel after diffusion backwards and forwards through the thickness of the glass, is reflected on to a much larger area than that upon which it originally impinged, with the effect of fogging out all dark shadows that come in close proximity to a bright light. It is impossible to examine the landscape work shown in a photographic exhibition without being struck by the large proportion of productions which are very seriously damaged by halation. We see, constantly, trees and foliage, that should come out clear and crisp against the sky, weak and grey; masts and rigging of ships losing their beautiful bright tracery, and looking almost as if the smoke from some passing steamer had obscured them; and a general dinginess made to pervade that part of the picture which should be bright and powerful. Of course there are exceptions, in the shape of photographs where the evils of halation have been guarded against, but these exceptions, by their purity and beauty, serve to make the failing in other cases all the more conspicuous.

Various remedies, or rather preventives, have been adopted against halation. The one in common use in the old dry collodion days was "backing" the plate with some pigment of non-actinic colour. This, when not completely efficacious, was still of considerable service. This preventive has not, for various reasons, been employed to anything like the same proportionate extent with gelatine plates, that it was with collodion. The manufacture of sensitised plates by the actual user of them is now as much an exception, as the contrary state of things was in the case of dry collodion plates; and the user is naturally disposed to take the plates as he purchases them, without further preparation. Then, again, he will be unwilling to expose his plates over to the light of the dark room, during an extra operation. A further difficulty will quently arise from the want of a drying room, or box, in which to leave the plates with safety whilst the pigment is drying.

Another remedy sometimes adopted with collodion was that of staining the film itself. This, one would suppose, should be very efficacious with gelatine plates, but we cannot learn that it has been adopted to any great extent. It has been stated by those who have experimented on staining gelatine plates with yellow vegetable dyes, that considerable orthochromatic effects are thereby obtained, and thus two very desirable objects should be achieved by the same operation. If a large proportion of alcohol be used in the colouring bath, the plates will dry rapidly. We propose shortly to go more fully into this branch of the subject.

A third preventive of halation is one that strikes at the original cause. The film of bromide of silver always intercepts a large portion of the light which is passing through, but on account of the diactinic colour of the compounds, especially when in a highly sensitive condition, enough light will traverse a film of ordinary thickness to produce the halation of which we are speaking. To ensure freedom from halation, then, it will suffice if the film is of sufficient thickness or body to absorb all the light which traverses it. Where competition is keen in the matter of price, there is of course a strong inducement for the gelatine plate manufacturer to use as little of so expensive an article as bromide of silver as will suffice for ordinary requirements, and there is no doubt that a film which would show halation badly with some landscape work, may not show it at all in ordinary studio use. It is probable that some few landscapists prepare their own emulsion and coat their own plates, influenced chiefly or solely by the determination to have silver enough in the film to ensure them against halation.

Yet another and most effectual preventive of halation is the use of paper instead of glass as a support for the sensitive film. For some reason or reasons, negative films on paper have not so rapidly taken the place of those on glass as was by many expected at the time they were first commercially introduced. Their value in securing freedom from halation is undeniable, and indeed it was the clearness and beauty of leaf and twig standing in the proper relation against the sky, shown in prints from some film negatives that recently came under our observation, which brought the subject of halation and its preventives forcibly to our notice.

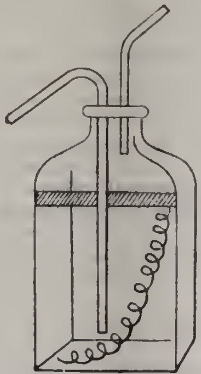
THE PRESERVATION OF THE OXALATE DEVELOPER.

Perhaps the greatest attraction of the oxalate developer is the circumstance that when mixed ready for use, it can be preserved indefinitely, provided that air be excluded;

and ever since Carey Lea introduced it in 1878, numerous arrangements have been designed for facilitating its use and preservation. More than this, its restoration, when exhausted, to a condition of usefulness is an element entering into the matter, as a developer in which the iron has been converted into a ferric salt by use becomes more or less completely restored by exposure to light according to the condition of the liquid. Here, indeed, we have just such a reduction of the ferric salt to the ferrous condition as takes place in the case of ordinary platinotype paper.

A. Thiry, in a communication to the *Correspondenz*, recommends the following way of dealing with the oxalate developer, and states he has adopted it with success during the past four years. To begin with, he uses mineral oil as a preservative against the action of the air, a course long since recommended by Warnerke, and he prefers to use a thick lubricating oil.

The apparatus almost explains itself, consisting of a glass bottle provided with a cork (an india-rubber cork is best) fitted with two glass tubes bent as shown in the diagram. The bottle is tilted so as to immerse the open end of the lower tube into mineral oil, and the mouth being applied to the other tube, as much oil is sucked in as will form a layer a trifle under half an inch deep—all being now ready for the reception of the used oxalate developer ; but before sucking this into the bottle, a small quantity—say ten grains to each half-pint—of finely-powdered oxalic acid is stirred in. The bottle being now sufficiently full, a coil of fine iron wire is introduced in order that the excess of oxalic acid may ultimately become neutralised, and the bottle is set in the window of an ordinary room—if in the direct sunshine so much the better. In a few hours one may draw off the regenerated developer directly into the developing glass.



A number of these bottles may be fitted up according to the requirements of the case, so that several may be reckoned upon as containing developer ready for use.

NOTES ON THE ART GALLERIES.

THE NEW ENGLISH ART CLUB AT THE DUDLEY GALLERY.

BY WIDE ANGLE.

This very interesting exhibition may be regarded as a sort of protest against the inanities which crowd the walls of the Royal Academy. The pictures are in most cases the work of our younger men, who, following the example of Holman Hunt, have endeavoured to think for themselves. They have perhaps not succeeded in carrying out their ideas in every case, but of their earnestness there can be no question.

Mr. Horsley would hold up his hands in horror at T. Roussel's "Reading Girl" (No. 4), a nude study of a long-limbed girl seated in a chair reading a magazine. There is not the least attempt at idealization in this picture, and most probably the model had, as the painter has represented her, very long legs and somewhat thick ancles. To many the picture must appear startling, and were it photographed a magistrate would probably stigmatise the photographs by the vague term "objectionable." W. L. Wyllie has deserted the river Thames, with which his name is associated, for inland scenery, and has given us an August day in Kent, in which the dryness of the herbage and atmosphere has been admirably rendered. If the artist really saw the multitude of rabbits and crows apparently gambolling together as he has shown them, he must have been witness of a marvellous sight. Some of the crows, by the way, are almost as big as the rabbits. J. H. Davies' "Sea and Sky," and Fred Jackson's "May," are both honest attempts to render nature as she is. The "Mill Pond" of J. W. Hamilton is tender and poetic in treatment, and very praiseworthy are the trees in the distance and their reflections. F. Bramley's "Weaving a Chain of Grief," in which a girl in mourning is twining together a wreath of white chrysanthemums, is a very conscientious piece of work. Mr. Bramley has not attempted to make the girl too pretty. Her swollen eyelids and hastily-arranged hair tell of nights of anxious watching and grief.

G. Clausen's "Stone Pickers," two females—a girl and old woman—is very truthfully rendered. The coarse, strong hands and wrists of the girl are very natural. T. F. Goodall's "The Bow Net" is a very clever scheme of colour, and exceedingly well painted. Nelson Dawson, in his "Solitude," a dreary expanse of sandy shore broken up into pools by the receding tide, is out of the common. But one is tempted to ask whether, under such circumstances, the sandy foreground and distance would be of the uniform tint which Mr. Dawson has given it. Jacques E. Blanche's "Dieppe Casino—Evening" is a decidedly original picture. The colour of the flesh of the lady and two children in the twilight is very cleverly painted, and the attempt to render the misty outline which the figure assumes in the dusk exceedingly successful. The lights of the Chinese lanterns at the back jar somewhat the general effect, but give a character which, perhaps, justifies their presence. J. H. Tuke's "The First Boat in," is one of the most vigorous pieces of painting in the Exhibition, and there is an indication of reserved force which adds much to the power of the picture. The sea and the figures of the two boys in the boat are most careful studies, and nothing could be better done than the face of the lad holding the tiller. The "Good-bye" of T. C. Gotch—a young sailor grasping the hand of a girl—is simple in treatment, and tells its story admirably. Alex. Harrison, "In Arcady," is a study from the nude. The figures of the nymphs are well posed, and the lighting of the foliage highly effective. T. B. Kennington's "The Battle of Life" is, like all this artist's work, very careful and conscientious. The subject is a painful one—a workman has returned from the fruitless quest after a "job"; there is clearly no food nor money in the house ; the wife is in tears, and the girl, holding a baby, is looking on with symphathetic and wondering eyes. The drawn face of the man, and the desperation shown in the clenched hand resting on the knee, are well expressed. The fault of the picture is that everything stands out so clear, so literal, and the figure of the man somehow looks as if it had been stuck on to the canvas instead of being part of it. The picture, nevertheless, is deserving of much praise. P. W. Steer's "Chatterboxes" looks at first sight like a hideous nightmare. It is necessary to stand a considerable distance away to reconcile the blues, yellows, and greens, which are so vivid as to oppress the eye. Mr. Steer has been more successful in his other picture, "The Pier Head," an attempt to render the shimmering atmosphere of a very sunny day.

There are several fairly good examples of portraiture in the gallery. Among them may be mentioned "a portrait sketch" of L. Bernard Hall, P. Bigland's portrait of Mrs. Dochrell, J. E. Blanche's portrait of Prince Poiatowski, T.

Rossel's portrait of Mortimer Mempes, and J. S. Sargent's sketch of R. L. Stevenson and Mrs. Stevenson, the latter very original and unconventional. Mr. Sargent's other portrait exhibits his tendency towards hard chalky tones in a marked degree. It is not pleasant when a lady looks as if she had just washed her face, and had made it shine by using plenty of soap, the effect which Mr. Sargent often gets.

◆

BUSINESS MANAGEMENT.

BY CRITICUS.

No. V.

The usual appointments of a new place wherein to carry on photographic work do not differ from those we have been considering, provided portraiture be the branch selected, and there is evidence that a fair amount of business may be anticipated.

Like some other professions which largely depend for support upon the influence that can be brought to bear upon the well-to-do section of the community by attractive display, photography in its remunerative aspect obtains a greater chance of success when a prominent position is chosen. To be located upon or adjacent to a busy thoroughfare has nearly always been found more advantageous than the possession of premises in an out-of-the-way situation of any district. At the same time it must be remarked that notable exceptions are on record, wherein it has been shown that expert photographers can and do run busy studios miles from our crowded centres. Such instances, however, are the result of personal ability combined with unusual energy, qualities which, if not rare, are strictly individualistic. Perhaps it is needless to say that the most eligible site is likely to be the most expensive as regards rent, &c. ; it will also, in all probability, be saddled with the largest number of restrictions. Objections to additional rent and stringent conditions we should cast aside if there appeared to be good reason for supposing that the amount of business done would be greatly in excess of that which might be expected in other premises situated in the neighbourhood. Whatever selection is made, whether it be a corner house or any other building, we advise, before making any alteration, or, indeed, signing a tenancy agreement, that a complete plan of the proposed change be submitted to the landlord, and an undertaking arrived at in respect thereof. This, and the future right of disposal, form the chief points requiring settlement. Sanction to construct or alter existing buildings is in a general way necessary also from municipal authorities or the district surveyor before work of this kind can with safety be attempted ; as the condition entails an expenditure of a special fee to the local official just named, he may prove exceedingly troublesome if the instructions laid down for his guidance be unobserved ; in fact, he has the power to order the removal of any structure that would be suitable for permanently carrying on a photographic business, in the event of his office not being consulted.

The advantages likely to accrue from the possession of a shop window for the display of specimen photographs may very often be more imaginary than real. Indeed, unless there is a reasonable probability of retailing picture frames, mounts, artists' material, publication work, photographic and other scientific novelties, as auxiliaries for attracting attention and adding to the profits, a shop may, if high rented, involve a beginner in financial disaster. A good show is, of course, indispensable, but whether this should include the work of other photographers (we refer to the published portraits of actresses and notables generally), or even an inordinate quantity of one's own productions in a special direction, is open to question. A few examples of choice photographs illustrating variety of size and style are, when tastefully arranged, more highly appreciated by that section of the public from whom we desire to gain esteem and support, than a whole shop-window full possessing mediocrity would be. That an exhibition of publication work collected from the leading studios of the world, and including representations of persons of mark and notoriety, does attract attention, must be admitted ; but we are by no means sure that it leads to an augmentation in the number of sitters. Rather strive to make the external appearance of the premises attractive by reflecting the capabilities of the interior arrangements combined with skill, and ever keep it so by frequent change of the specimens exhibited.

Putting aside the question of a shop for settlement in accordance with individual taste and opportunities, we come to the necessity of a reception or waiting-room more or less elaborately furnished. Here a prolific exhibition of work can be made ; in it all modern processes of value can well be represented, enlargements and opals in carbon and silver, including the various modes of finishing in oil, water, crayon, monochrome ; ceramic enamels, porcelain, plaques, and china ; novelties in frames and styles of mounting can be arranged to the best advantage, and a sufficient knowledge of the qualities, capabilities, and prices of each should be possessed by the assistant in charge of this department, and intelligently conveyed to customers whenever conversation offers an opportunity. Visitors at a photographer's establishment, at least those who have spare time on their hands, are usually ready to be interested in our art and its possibilities, and naturally expect anyone engaged on the premises with whom they may come in contact to be ready with information on the subject. It therefore becomes advisable that whoever presides over the reception or show rooms should possess the quality referred to in a high degree, or the exchequer will inevitably suffer in consequence, and we may add that a well-developed business capacity is here so essential towards achieving ultimate financial success that it is a wise policy to secure the best services that can be obtained irrespective of cost.

No place can be considered complete or properly fitted for receiving sitters which does not comprise in its appointments more than one dressing room ; these need not of necessity be elaborately furnished, or at any rate, those that are reserved for gentlemen. Still, something more than a deal shelf supporting a defaced looking-glass, worn-out brushes, and combs minus half the teeth, is desirable. Ladies' dressing rooms should be furnished in good style, although not necessarily in an extravagant manner, since further outlay for improvements can at any time be made, should the success of the establishment warrant it.

We do not propose to include a detailed plan of constructing a studio, there being so much information already available in the volumes of the News, Year-Books, and "Studios of Europe," but will content ourselves by mentioning that we give preference to a studio with a high ridge roof, in which the glazed portion has a good pitch, not only on account of the little trouble required to keep it clean, the perfect manner in which it excludes rain, snow, and its attendant inconveniences, but more especially for the superior character of the lighting obtained. From an acquaintance with a large number of studios, we think, without exception, that the most effective was one of very simple construction. In dimensions it was 40 feet long, 15 feet broad, and 12 feet from ridge to floor ; running east and west, midway on the side facing north, was inserted one sash, 15 feet by 12, and in order to secure a sharp angle, the base terminated within about two feet of the floor. Large sheets of glass were employed to reduce the number of the vertical bars, with the result that more light was admitted, and a better appearance presented. It will be seen that an arrangement of this kind enables both ends of the studio to be utilised with equal facilities. Few blinds and reflectors are ever needed, and the quality of illumination is very nearly perfect. A high-pitch glass roof may, under certain conditions, cause too large an amount of diffused light to enter the room, or rather to be reflected from the opposite wall. Curtains can easily be arranged to regulate the inlet, so that in practice no real inconvenience need be felt. As internal reflection adds greatly in securing details in a model, and there is a possibility of getting too much, it is better to paint the interior walls a neutral tint (pale green is a suitable hue), and improve the appearance by means of panels of a deeper shade.

Studio furniture, it is perhaps needless to remark, may comprise any number of articles besides chairs, lounges, tables, headrests, backgrounds, and optical arrangements. With regard to the use of the first named in pictorial representation, pleasing effects are more easily produced by the judicious introduction of drapery, and a curtain, either lace, tapestry, repp, or velvet, becomes a valuable adjunct; whilst under the heading of backgrounds, suitable interior, floral, rustic, and marine, foreground and other accessories have to be requisitioned. All forms of support for the head and body are included under the term "headrest," an instrument universally disliked, but one which we regard as a necesssary evil, and, in passing, desire to impress upon beginners the advisability of purchasing only the better and more solid makes. We regard it as imperative that these should be kept scrupulously clean, and any objection raised to the employment of them in portrait making be skilfully overruled. Fixed backgrounds appear to us somewhat of a conventional mistake; we therefore recommend an arrangement which enables them to be opened like the leaves of a book. By this means greater contrast can be obtained, provided the position of the background be placed at a moderate angle to the principal source of light. No one will deny that some subjects require more contrast than others, therefore it is better to secure the power for use when needed, since brakes are easily applied either by modifying the angle, or the introduction of reflectors and screens. A very useful reflector may be constructed in the following manner:—Make a rectangular frame like an ordinary canvas stretcher 4 ft. by 4, and over it strain some light material (cheap unbleached sheeting answers); a coating of common glue size is then given, after which it may be distempered or covered with stained wall-paper. We prefer the ultramarine shade of blue, a colour most successfully employed in the early days of professional portraiture before retouching came into vogue. In this manner a liberal proportion of shadow may be used to secure brilliancy, and sufficient detail can then be introduced by the aid of reflected light; if this is skilfully done, the labour by retouching becomes reduced to a mimimum. Probably the most convenient way of using such a reflector is to mount it cheval glass fashion on a tolerably strong framework; it can then be swung at any angle. Semi-transparent screens are very useful adjuncts to the studio. It may happen that a strong light falls on a portion of the subject, perhaps a silk dress, light hair, bald head, and so forth, which it is desirable to subdue. By interposing a thin screen of muslin, gauze, or alpaca, sufficient light may be filtered through to properly illuminate the subject, and check the remainder.

In a studio of the dimensions specified, there would be plenty of space for scenic arrangements situated beyond each end of the skylight, and a corner for more pronounced effects, *à la Rembrandt* also. Much time is saved by making these preparations, and there is a distinct advantage in a plan which enables a customer to at once take his or her position without preliminary fuss or commotion; the result secured being, as a rule, far more satisfactory both in expression and pose. The truth of this is recognized by our leading photographers, many of whom have two or three studios arranged with all the necessary appliances *in situ* for the production of a specially designed picture. When a client desires to be photographed in several positions, including changes of lighting and accessories, this can be easily and expeditiously done, causing little extra effort to the sitter beyond that of walking from one set piece to that of another. We do not advise beginners to adopt such an imposing style at first, for we doubt whether the returns would justify him in so doing, and this, after all, is the criterion which must guide him.

Anyone, experienced or otherwise, entering upon a photographic business career in a well settled neighbourhood, must not feel disappointed because abundant work is not immediately forthcoming; indeed, for a time at all events, the commissions which find their way to a new place may be regarded as so much regular business from certain easily defined causes diverted from the ordinary or pre-existing channels. Most likely an energetic personal canvas among friends, followed by enlisting those persons' sympathies in a more extended field, starts the concern into action; these influences, combined with the introduction of novelties of an especially attractive character, and a low scale of charges, are generally the early experiences of launching a new business.

Prices of a sufficiently high standard to cover cost of production, including good material, fair wages, and a moderate profit for the best work the establishment is equal to, should be arranged and afterwards maintained. Two prices for the same article is an error that at any time may lead to failure, and he who grasps orders at unremunerative rates, like the drowning man catching at a straw, will sooner or later fail in his efforts, and drop quietly down the stream. Everybody who has had any experience knows how difficult it is to raise the standard of prices after they have once been lowered in any business where competition has an opportunity to creep in, and low charges having prevailed for a long time in photography, the only available alternative that remains for improving the exchequer appears to be in the direction of increased business. Hitherto there has been what may be termed an elastic limit in the demand for photographic productions, dependant very much upon novelty. It therefore behoves those interested to again bestir and devise some special means whereby the demand may be augmented, or it will be idle to expect every well-managed business to flourish.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter IV.—Hydrogen: its Preparation and Properties—Diffusion of Gases—Specific Gravity of Gases—Valency—Water, Hard and Soft—The Purification of Water.

Water contains eight-ninths of its weight of oxygen, the other ninth is hydrogen.

Hydrogen is a gas, and it is the lightest substance known. It is only one-eighth the weight, bulk for bulk, of the next highest substance, so that its lightness is exceptional and characteristic. The chemical formula of water is H_2O, and the hydrogen can be set free from this compound by passing steam through a red hot tube containing iron filings or nails. The change that takes place is represented thus—

$$3Fe+4H_2O=Fe_3O_4+4H_2.$$

The oxide of iron produced is black, and forms a closely adherent film upon the surface of the metal. When carefully produced this coating is usefully protective to the metal beneath, and ornamental iron work and culinary apparatus are sometimes treated with steam at a high temperature, the oxide produced serving instead of enamel or paint. This black oxide is the most stable of all the oxides of iron; it will not readily react with acids to form salts.

But it is far more convenient to get hydrogen from hydrochloric acid by the action of zinc. The metal will decompose the acid alone in the gaseous condition, thus—

$$2HCl+Zn=ZnCl_2+H_2.$$

forming chloride of zinc and hydrogen; but it is better to use the aqueous solution of hyrochloric acid (that is, the "hydrochloric acid" of commerce), and to add this, a little at a time, to the zinc after covering it with water. The water dissolves the chloride of zinc produced, and so keeps a clean surface of metal for the acid to act upon.

Hydrogen burns readily in the air, combining with the oxygen in the air to form water (H_2O).

$$2H_2 + O_2 = 2H_2O.$$

This equation indicates the proportion that exists between the volumes of hydrogen and the oxygen with which it combines when it burns, if we bear in mind that an equal number of molecules of any gas occupy the same space under uniform conditions of temperature and pressure; or, in other words, that the bulks of gases are proportional to the number of molecules. As in the above equation two molecules of hydrogen require one molecule of oxygen, we may say that two volumes (pints, litres, &c.) of hydrogen will combine with one volume (pint, litre, &c.) of oxygen when it burns. This combination is gradual and safe when the hydrogen burns from a jet, but if the gas is mixed with the oxygen or air that it requires for combustion, and a fire is put to the mixture, the whole bulk of gases burns almost simultaneously, the high temperature produced by the burning is developed suddenly instead of gradually, and we have an explosion with its unwelcome concomitants.

Of all the gases that the photographer is likely to have to deal with, perhaps hydrogen is the most likely to lead to accidents. And as coal gas is, roughly speaking, about half hydrogen, we do not go very far wrong in saying that whatever precautions are necessary in dealing with hydrogen, are also necessary with coal gas.

Hydrogen is not only exceptionally light, but in the movements of its particles it is far more agile than any other substance. If we were to try to fill a vessel made of unglazed earthenware or plaster of Paris with hydrogen by passing the gas into it, we should find our attempts unsuccessful, because the gas would rapidly escape through the invisible pores of the material. Under these circumstances, as the hydrogen passed out, the air would pass in, so that a mixture of gases would be obtained in the vessel, and perhaps an explosive mixture. Minute holes or pores in gas bags lead to similar results when the bags are not under pressure, and are very likely to cause accidents. A gas-holder or gas-bag that is not certainly in perfect condition, may be safely used for oxygen, because this gas is slower in its movements than hydrogen, and will be useful, or at least never dangerous, when mixed with even a large proportion of air.

This property that gases have of passing through porous substances is called "diffusion." The diffusion of gases takes place at a rapidity that is inversely proportional to the square roots of their densities; for example, in the case of hydrogen and oxygen, the densities are as 1 to 16, the square roots of these figures are 1 and 4, and reversing these we get 4 and 1 as the relative rates of diffusion of hydrogen and oxygen.

As hydrogen is the lightest gas, it is convenient to take it as the unit of weight instead of air. The proportional weights or specific gravities of the simple gases are then expressed by the same figures that indicate their atomic weights; that is, oxygen is sixteen times heavier than hydrogen, nitrogen fourteen times, and so on. And if the weight of a unit volume of hydrogen is known, the weight of the same volume of any other gas is easily calculated. As a matter of fact, one litre of hydrogen weighs ·0896 gram. To take an example of the usefulness of these figures, we may suppose it to be required to find what bulk of oxygen can be got from a given weight of potassium chlorate. We have already seen that the weight of potassium chlorate is to the weight of oxygen as 122.5 is to 48. If this calculation is made in grams, the bulk of gas is readily got by dividing the weight of oxygen by .0896 multiplied by 16, the result being in litres. Litres can easily be converted into cubic feet or gallons by the aid of a table book, if such conversion is desired.

Hydrogen is also the unit in comparing combining power. Some elements have, atom for atom, a combining power equal to that of hydrogen; some have a greater, but none have less. Combining power is called "valency," or, less wisely, "atomicity." The valency of the few elements that we have included is shown in the following table.

One.	Two.	Three.	Four.	Five.	Six.
H	O	N	C	N	S
Cl	S	Au	S		
Br	Ca	Fe			
I	Fe				
K	Hg				
Na					
Am					
Ag					
Hg					

The use of this table is very simple. If the formula of chloride of gold is wanted, we find that gold has three times the valency of chlorine, and that therefore one atom gold will be equal in combining power to three atoms of chlorine, $AuCl_3$; but chloride of sodium is NaCl, because both elements have an equal valency. The oxide of gold would be one and a half of oxygen to one atom of gold, and as half atoms are not allowed, the formula becomes Au_2O_3. The formula of sulphuric acid being H_2SO_4, the expression for any sulphate can be got by replacing the hydrogen of the acid by an amount of the metal that is of equal combining power; K_2SO_4, or $CaSo_4$, because one calcium or two potassium atoms are equivalent to two hydrogen atoms.

Some of the elements occur two or three times in the above table, because they form two or three series of compounds. In such cases those compounds in which the metal has the lowest valency are designated by the adjective termination "ous" to the metal, and those with the higher combining power have the termination "ic." Thus ferrous chloride, $FeCl_2$; ferric chloride, $FeCl_3$; mercurous chloride, HgCl, mercuric chloride, $HgCl_2$. It is customary with some always to write two atoms of mercury in mercurous salts, and two atoms of iron in ferric salts, thus Hg_2Cl_2, and Fe_2Cl_6; but this does not interfere in any way with the proportions. The simpler method is sufficient, and not incorrect.

Sulphur occurs in three columns in the table, showing its condition in sulphides, sulphites, and sulphates respectively.

Water is the most important of all the compounds that contain hydrogen, and is produced whenever this gas is burned, whether it is alone, or combined with other substances as in ordinary fuel. Water can easily be separated into its constituent elements, and the proportions in which these are present has been proved beyond a doubt. Pure water, however obtained, has invariable properties under uniform conditions; it is neither acid nor alkaline; it is colourless except in layers of considerable thickness, when it transmits blue light; it is tasteless, it boils at 100° C. (212°F.), and solidifies to ice at 0°C. (32°F.) It vaporizes at all temperatures; even ice and snow give off vapour when the air is below the freezing point, but, other things being equal, it vaporizes more rapidly at a higher temperature.

Gelatine plates, carbon tissue, prints, &c., &c., are dried by the evaporation of the water from them. A high temperature favours drying, but a high temperature without ventilation is useless, for at any temperature below that of boiling water, air may be "saturated" with moisture. This moist air must be removed to allow dryer air to come and carry off its load of moisture. The hotter the air is, the more water it can hold before becoming saturated.

Water combines with many things, often liberating much heat as it does so. The slacking of lime is a familiar example; here, the lime (CaO) combines with water to form the hydrate of calcium (CaH_2O_2). Blue vitriol, or sulphate of copper, is found as blue crystals which contain water ($CuSO_4 5H_2O$). The sulphate of copper without the water is neither blue nor crystalline. This water is called "water of crystallization."

Water is the most universal and useful solvent, and is never pure, because it dissolves a certain proportion of whatever it comes into contact with. Our natural sources of water are supplied from the clouds, and even rain-water is not pure; it contains dissolved oxygen, nitrogen, carbonic acid, and other gases in less proportion that it has taken up from the air. As ordinarily collected, it has also whatever it can gather, as it passes over roofs and gutters on the way to its tank. River water contains, in addition, a modicum of earthy matter of a nature determined by the soil over or through which it has flowed. If the soil is purely sandy, the amount of matter imparted to the water is infinitesimal; but gypsum (that is, sulphate of calcium or sulphate of lime, $CaSO_4$) is soluble in five hundred times its weight of water. Chalk or limestone (that is, carbonate of calcium or carbonate of lime, $CaCO_3$) is not appreciably dissolved by pure water, but if carbonic anhydride (CO_2) is also present, it forms with the calcium carbonate the soluble bicarbonate of lime ($CaCO_3CO_2$). The carbonic anhydride is rarely lacking; a little is taken up from the air, and more is furnished by decaying vegetable matter. Of other substances, common salt (NaCl), Epsom salts ($MgSO_4$), nitrates of potassium and sodium, readily dissolve in water, and magnesium carbonate dissolves in a similar way to calcium carbonate. The most important of these things that are taken up by the water make it what is called "hard," because they prevent the lathering of soap. Any hardness due to the presence of bicarbonate of lime, and most of that due to bicarbonate of magnesia, can be got rid of by boiling to drive away the carbonic anhydride that has made these salts soluble, and so precipitating the carbonates. The chief constituent of boiler "incrustations" and the "fur" of kettles is carbonate of lime. Hardness that can be got rid of by boiling is called "temporary hardness." The carbonate of lime can also be removed, on the large scale, by adding lime to the water, and then allowing the precipitate of carbonate of lime to settle down. This is Clark's process. The lime combines with the carbonic anhydride of the bicarbonate of lime, and changes the whole into the insoluble carbonate of lime, thus—

$$CaCO_3,CO_2+CaO=2CaCO_3.$$

Hardness due to sulphate of lime and to other compounds that are not thrown out of solution by boiling is called "permanent hardness."

Water also sometimes contains organic matter taken up from decomposing animal and vegetable substances, or introduced by sewage or other drainage water that accidentally, or of set purpose, has gained access to.

All the non-volatile impurities of water are left behind by distillation, and water so prepared is the purest that can be got in any quantity. Distilled water should be used for solutions of oxalates (ferrous oxalate developer), and for any solution containing silver. But ordinary tap water may be used even in these cases, if the injurious matters present are got rid of by adding a little of the oxalate or the soluble silver salt to the water, and allowing the precipitate formed to settle down. The action of the nitrate of silver should be allowed to take place in a glass vessel and in the light, so that organic matter may be removed. The purified water should be tested, to see that an excess of the reagent is present, by adding a drop or two of a solution of calcium chloride to a small quantity of the water to which the oxalate was added, or a little common salt in the case of the nitrate of silver; if a turbidity is not produced, the water has not had enough of the purifying reagent added to it.

The storage and conveyance of water needs care, for soft water attacks lead or zinc to a dangerous extent. Hard water may be kept in contact with these metals, because the sulphate and carbonate present soon form a protective coating which practically stops the solvent action; but distilled water should not be allowed to come into contact with anything but glass, good earthenware, or tin (that is, "block-tin," not the "tin" of the whitesmith, which is tinned iron).

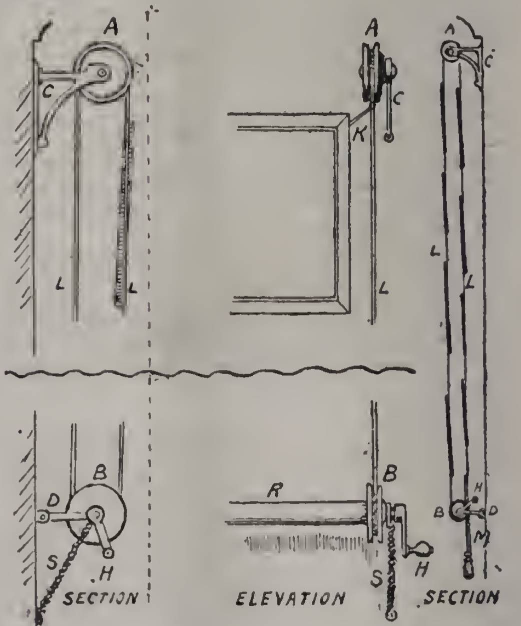
EXHIBITION PICTURES: THE "EYE-LINE" FOR ALL.

BY C. R. KING.

Photographers, professional and amateur, who are accustomed to exhibiting their productions at picture galleries, must all, at some time or the other, have experienced a feeling in common with workers in oil and water colours; this is, after their pictures are admitted by the ruling committee to be sufficiently meritorious as to deserve a place on the walls, that they should be ignominously "skied," or, on the other hand, placed in such proximity to the floor that the inevitable result is they are passed by unnoticed by the greater portion of an indolent public, while the technical visitor subjects himself to bodily agony in his endeavour to discover the chief points of a picture. But the thought that some indifferent works should apparently receive favouritism from those intrusted with the hanging arrangements causes most bitterness.

It may be safely supposed that it was ever so, is now, and, the corollary follows, ever will be—so long, indeed, as there are more pictures shown than there is wall space provided to permit of their being viewed with ease.

This is, however, presuming nothing can be done to lessen the trouble; but I venture to think the provision of a simple mechanical appliance can. The following suggestion, briefly put, is to work the pictures on to the "eye line," one by one as they are required, by means of cords carrying them over and around pullies to be fixed to the walls. The rough sketches may assist the description of the apparatus.

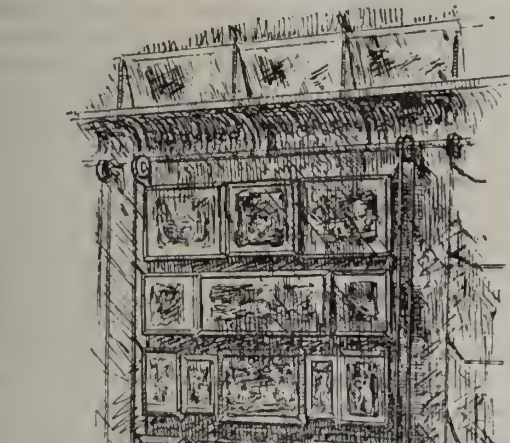


A A, top pullies, double flanged and serrated, fixed to the wall by supporting brackets, C. B B, lower pullies coupled together by a longitudinal rod of wood or tubular iron, R. D, pivoted arm carrying axle of the roller, R, and which is revolved direct by the handle, H, or a pull-cord, M, working a ratchet, where a handle would be inconveniently high.

L L, endless cords woven with copper wire. S S, coiled springs to maintain the necessary tension on the cords in variable weather, and to thus prevent the suspended weight of frames from pulling the cords inwards near the middle. K, cords fixed transversely from the vertical lines on either side. To these the frames are hooked, or, in the case of a number of small ones, to a lath or light iron rod fixed to the ends of the last named cords, so that a number of them can be hooked side by side in a straight line. The distance of the roller, R, from the floor would depend upon the deepest frame to be hung in that particular "panel." The frames might be tilted, or the top ones thrown "proud" of the wall by shortening the arm, D, as in sketch.

It would be necessary to hang the frames so that, whatever pictures come to the front, the load of frames on either side of the pullies should properly counterbalance; the only exertion necessary then would be to overcome the inertia and friction, and this, with ball bearings, need be but slight.

By turning the handle the topmost pictures rise and recede, passing between the pullies, and then descend at the back, as the next row of frames come to the top. An index list could be placed near the handles to show at a glance all the pictures contained in that particular "panel."


Putting the Pictures in motion

Possibly some such arrangement as described would obviate a source of headache that visitors to exhibitions often experience, and which can be traced to the strain produced on the eyes by the continual adjustment and re-adjustment of the eyes' foci to objects at widely varying distances; and, while it would permit double the number of pictures to be hung, three times as many could be looked over comfortably; and possibly, too, popular opinion would display itself by those pictures that recurred most frequently in the most favourable position on the rollers, and for this practically illustrate the survival of the fittest.

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.*

Chapter III.

[*Reprinted from the* Photographic Times.]

A Patient Photographer—Joseph Nicéphore Niepce.—The first man to obtain a permanent photograph was Joseph Nicéphore Niepce, who was born at Chalons-sur-Saone, March 7, 1765. Well-educated, his parents designed him for the Church, but the outbreak of the French Revolution upset all their plans, and in 1794 Niepce fought in the ranks of the Republican army which invaded Italy. Ill-health soon compelled his retirement from active service, and, marrying, he settled down at Chalons; his brother Claude, to whom he was devotedly attached, residing with him.

Even during childhood, the fondness of the brothers Niepce for scientific pursuits had been very noticeable, and they now applied themselves to the task of invention, bringing out a machine called the pyrelophore, which propelled vessels by the aid of hot air; and a velocipede, the ancestor of our modern bicycle. Endeavouring to bring these inventions before the public, Claude went to Paris in 1811, and afterwards crossed over to England, where he settled down at Kew. It was, apparently, about the year 1813 that Nicéphore Niepce began the experiments which resulted in his discovery of what may be called the bitumen process in photography. From his correspondence with his brother Claude we learn something of this method, and when, in 1827, Nicéphore visited his brother at Kew, he brought with him many specimens of his work. These pictures, the first permanent photographs ever produced, Niepce desired to bring befor the notice of the Royal Society, but as he declined to publish the process by which they were produced (being desirous to perfect it before making it public), the rules of the Society compelled them to refuse Niepce's communication. Having examined several of the specimens presented by this early French experimenter to his English friends, we can testify to the successful manner in which he had succeeded in copying engravings.

Making but a short stay in England, Niepce returned to France, where, in 1829, he entered into a partnership with another investigator named Daguerre; but Niepce was not destined to complete his work, or even to publish his results; he died in 1833 at the age of sixty-eight. Although it is impossible to assign the title of "Inventor of Photography" to any one man, yet Niepce has probably the best claim to it. Quite recently, a statue of Niepce has been erected at Chalons.

Lithography and Photography.—Lithography, invented by a German, Senefelder, in 1798, was successfully practised in France in 1812. Expert draughtsmen were required to execute the necessary drawings upon the prepared surfaces of the smooth blocks of limestone employed. Now Niepce thought that it might be possible, by the action of light, to cause designs, engravings, &c., to copy themselves upon the lithographic stone. The basis of all his work was the discovery that bitumen—or "Jew's pitch," as it was then commonly called—is rendered insoluble by the action of light. Niepce dissolved bitumen in oil of lavender, and spread a thin layer of it upon the stone. Next he varnished the drawing on paper, of which he desired to secure an impression—the varnish rendering the paper fairly transparent—and laid it upon the bitumenized stone. After exposing the whole to sunlight for an hour or so, the paper was removed and oil of lavender poured upon the bitumen, by which those portions of it that had been protected from light by the opaque lines of the drawing were dissolved away, and the surface of the stone beneath was in those parts exposed. Thus the outlines of the original subject were reproduced with perfect truth. Lastly, by treating the stone with an acid, the exposed portions could be "bitten" or eroded more deeply, and it was then ready for printing from. Finding much difficulty in securing stone of a sufficiently fine and close grain, Niepce substituted metal, employing plates of polished tin, &c., on which to spread the bitumen. Although the results he obtained were far from perfect, yet they were very promising, and heliography, as Niepce named this method, has since proved very useful.

(*To be continued.*)

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* (Continued from page 137.)

Notes.

A well-known photographer divided the honours of the demonstration in Hyde Park on Easter Monday with the orators. With a camera attached to a tripod ten feet high, and himself mounted on a pair of steps, over which a commissionaire mounted guard, he commenced with his apparatus planted opposite No. 1 platform, and continued in the most business-like fashion until he came to No. 14. No. 7 was rather a trial, for the sun was exactly opposite the lens. However, with aid of his hat as a shade, the difficulty was overcome. The coolness and self-possession of the photographer under very trying circumstances were certainly remarkable. It was curious to note that the crowd had a very respectable knowledge of photography. They knew all about pneumatic shutters—at least one gentleman did, and gave a little lecture on the subject to his immediate neighbours, explaining, with much good intention if not with lucidity, what happened when the india-rubber ball was squeezed. They were not surprised at the quickness of the exposure, and, above all, they refrained from chaffing. The composure and almost indifference with which a London mob now regard a photographer at work are significant signs of their familiarity with the operation. Even the ten feet tripod stand was looked upon with placidity.

The Queen, so a society journal informs us, has had her photograph taken by a leading Dublin photographer, who was sent for to Osborne for the express purpose. "The Queen," says our contemporary, in all gravity, "expressed her wish that it should be understood that the sittings shall be given for Ireland." What can this wonderful statement mean? Surely it must have emanated from the imagination of the journal in question. Her Majesty has too much common sense not to know that Ireland does not care whether she is photographed by an Irish, English, Scotch, or Welsh photographer. Had the Queen intended to pay a special compliment to the Emerald Isle, she would of course have gone to Dublin to be photographed. If, however, our contemporary is right, it would be interesting to know whether the Princess Beatrice or her husband, who were photographed at the same time, gave *their* sittings for Ireland also.

The photographs to be shown by the Royal Institute of British Architects at the Adelaide Jubilee Exhibition have been on view at 9, Conduit Street. They numbered about a hundred, and were all taken from executed works, and not from architects' drawings. From the remarks of the Secretary, made at a meeting on Monday week, it would seem that it is not the universal practice of architects to have their finished buildings photographed, for, said Mr. Nevill, "we found that there were apparently no very large number of suitable photographs in existence." Neither was it possible to have photographs taken, as the time was short, and fogs were plentiful. However, taking into consideration the drawbacks, and that the exhibition was the first one of architectural photographs held in any way officially, he thought that it was not only interesting, but as thoroughly representative of certain branches as its limited dimensions would allow. Mr. Nevill also gave it as his opinion that interiors and details were best illustrated by photographs, and he hoped the day might not be distant when such photographs might be admitted to the walls of the Royal Academy. There is no reason why Mr. Nevill's suggestion should not be carried out. The architect's drawing of his building is usually a very pretty building, but often absurdly unnatural. He cannot resist making his design look taller or wider as the case may be, and any adjacent object, the trees or people, are invariably dwarfed to get this effect. Photography would certainly not flatter in this respect.

It is almost startling to find that the reduction of maps and plans used in the drawing office of the Geological Survey of Philadelphia has only been performed by means of photography since 1883. Up to that time the work was done by the pentegraph. A paper by O. B Harden on the subject, read before the Engineers' Club of Philadelphia, and published in their transactions for the past year, records with delightful simplicity the fact that, by the employment of photography, "it has not been found that the size of the reductions affected in any way their accuracy." It would be very wonderful if it did. Mr. Harden remarks on the difficulty of photographing maps coloured in tints, such as chrome, orange, purple, red, and green, and has come to the very sensible conclusion that the lines drawn in black appear the most distinctly; hence it is preferable that maps should be in black to photograph well. The largest maps yet reduced for the Survey are those of the Philadelphia Water Department, and comprise altogether an area of about 773 square feet. The area of map-surface of the photographic prints—which are from thirty negatives—when put together, is about 193 square feet. A comparison of cost shows that there is a saving of about 40 per cent. over the other methods of reduction. This is where a reduction alone is required, and where the map will answer its purpose upon the sensitive paper. Where, however, the map is required upon tracing cloth, or where it has to be transferred to a more substantial paper, the saving is about 30 per cent.

A correspondent writes: "I quite sympathise with W. Jerome Harrison in his chases after false scents, which led him to unearth books with photographic titles having nothing whatever to do with photography. I have been a sufferer on two occasions. Once I was led astray by the British Museum catalogue, which gave me the title "Sunday School Photographs." Here, thought I, was a curiosity. Photographs of Sunday school scholars, taken of course on Sunday, must be interesting. Judge of my disappointment when I found the diminutive volume was of the most pronounced goody-goody type, and had nothing in it photographic save the title. The second "sell" of this kind was even more aggravating. In the periodical catalogue of the British Museum appears *El Daguerreotipo*, a journal dated 1850, published in Mexico. This was so promising that I awaited the arrival of the volume with some impatience, even though it involved learning Spanish in order to understand it. To my disgust when it was brought, I found it had a sub-title running thus: "*Revista Enciclopedica y Universal.* The meaning of these words, which I easily made out, and the look of the journal—newspaper written all over it—were enough. People ought really to be forbidden using titles of this kind. The time of photographers, especially in fine weather, is valuable."

An American painter of note, who had a picture photographed recently, was much disturbed at finding the brush marks on one of the figures, which were not apparent to the naked eye, quite visible in the photograph. No amount of "dodging," so far as the arrangement of the lighting was concerned, overcame the difficulty, and it was curious that the marks showed in no other part of the picture. At last the artist recollected that he had had a good deal of trouble with this particular figure, and had originally painted it of another colour, and he came to the conclusion that this first colour, though it could not be seen by the eye, showed through the second colour, and affected the photograph. So at least says a contemporary.

Said a timid amateur photographer the other day: "Do you know, I'm half afraid of using ammonia to fume my silvered albumenised paper. I've read somewhere that ammonia forms an explosive compound with silver, and I don't want to have any accidents." The professional to whom he addressed his observations happened to have a good photographic library, and quietly taking down Professor A. S. Taylor's book on "Photogenic Drawing," published in 1840, he pointed out the following re-assuring passage:—"It has been said that the process here recommended for the preparation of photogenic paper by the use of ammonia and the nitrate of silver is dangerous from the liability of these substances to form an explosive compound. Having used large quantities of this solution at every period of its preparation, experience enables me to say that not the smallest danger is likely to occur from its use when prepared according to the manner here recommended." It is needless to say that the amateur was quite satisfied with so high an authority as Alfred Swain Taylor.

It is to be hoped that the Photographic Exhibition to be opened in Florence during May will be a success; and it may be noted the time for sending in exhibits has been extended to May 10th. The address of the Committee is 33, Via S. Gallo, Florence.

What can be more annoying than to send a negative to an advertising firm professing to make enlargements cheaply—promptly—well, and then, after having received a bad enlargement, smaller than the professed size, not to be able to get one's negative back? Yet this frequently happens, if we may judge from the complaints we often receive.

One correspondent who had been served in this way, took our advice to write to the district police office making enquiries, and he now writes to us:—"To-day the Superintendent writes me that —— —— will return my negative on receiving 3d. for postage. I have sent them the stamps, although I had already sent them 3d. for the postage at the time of sending the order for the enlargement. However, I am glad to get out of their hands in any way."

The joint exhibition of photography, representing the work of three leading photographic societies in America, was opened the first week in this month at 345, Broadway Over a thousand pictures, many of which were illustrative of new processes, were exhibited. The exhibitors, many of whom were amateurs, numbered over a hundred. A novel feature was a special diploma reserved for lady exhibitors. Here is a hint for the Photographic Society if it wants, as the President intimated on the occasion of the presentation of his bust, to encourage lady photographers to join the Society.

Photography can easily render a short man tall, providing he is taken by himself; but when somebody else a head taller is taken with him, the task is difficult. According to the *Agents' Star*, a New York class paper, a prominent Washington photographer recently photographed a group of the judges of the Supreme Court. They were all pleased with the picture excepting one, who objected because, as he confided to the artist, it made him look too short. The photographer said the defect might be got over, but refused to destroy the negative unless the dissatisfied justice would undertake to bring all the members of the court together for another sitting. This he succeeded in doing, and the photographer proceeded solemnly to provide the short member with a box to stand upon. As the diminutive judge had not explained the real reason why they had been assembled a second time, the joke suddenly dawned upon them, and they had a good laugh at the short man's expense. Evidently judges in America are not held in so much respect as they are in England. What London photographer would dare to play off such a joke on the august administrators of the law?

Painters, as well as photographers, suffer from the effects of fog—atmospheric, we mean. The dark, dreary days of this long winter are likely to have a deteriorating influence on the Academy show, at least, so far as the number of important works is concerned. Mr. Fildes will send no picture of any magnitude, only a couple of portraits; Marcus Stone will content himself with exhibiting some minor works which, to use the words of a contemporary, "he has fished up from the recesses of his studio;" Sir John Gilbert will contribute but one painting, and Mr. Goodall, F. Dicksee, Mr. Boughton, and Mr. Jeames, one each. Mr. Goodall has also been at work upon a nude study "Andromeda," but out of charity to the feelings of Mr. Horsley, who was terribly scandalised last year by his brother R.A.'s Susannah, this may not be exhibited at the Academy.

FIXING SILVER CHLORIDE PRINTS BY MEANS OF SOLUTION OF AMMONIA.

BY ROBERT H. BOW, C.E., F.R.S.E.*

To the usual mode of fixing photographic prints by means of hyposulphite of soda there are two leading objections : the first is the thorough after-washing required, necessitating the expenditure of much time and water to get rid of the hyposulphite of soda and silver ; the second is the doubt that o'ershadows the process as to the permanency of the prints even after all this trouble.

To eliminate this second objection, various oxidising agents have been proposed, such as the peroxide of hydrogen, chlorine, &c., to destroy the last traces of the hyposulphites ; but these are, I believe, seldom employed.

At any rate, the first objection is so formidable as to make it desirable to escape from it.

Several substitutes for the hyposulphite of soda as fixing agents have been advocated. The sulpho-cyanides were extensively used in 1867 by M. Civiale, and again, in 1874, by M. Cayol ; and in the *British Journal of Photography Almanac* for this year, the use of sulphite of soda is advised and described by Captain Abney.

Although the solvent powers of solution of ammonia have been known since the infancy of chemistry, I am not aware of any serious attempt having been made to use it as a practicable means of fixing the paper prints. Mr. Hume has obligingly directed my attention to Professor Hunt's "Photography," and I find in the edition of 1851 the author says :—"The chloride of silver being soluble in solution of ammonia and some of its salts, they have been recommended for fixing photographs. The ammonia, however, attacks the oxide, which forms the darkened parts so rapidly, that there is great risk of its destroying the picture, or, at least, of impairing it considerably. It matters not whether the liquid ammonia or its carbonate be used, but it must be a very diluted solution. The only photographs on which I have used it with any success, are those prepared with phosphate of silver ; and to these it imparts a red tinge, which is fatal to their use for transfers." In the edition of 1857, I understand, he adds the following remark : "Still ammonia affords a ready means of partially fixing a photograph, and thus preserving it until a more convenient period for giving it permanence."

These statements were not encouraging, and I fancy may have had much influence in staying further trials. As my experiments with ammonia fixing have, so far as yet tested, had very satisfactory results, I can only account for its non-employment to some prejudice, and to the very unsatisfactory appearance of prints treated by ammonia when these are not toned at all, or only moderately so, with chloride of gold. I find, when the gold toning is pushed far enough—that is, when the picture has, in a considerable degree, been converted from a silver into a gold one—that the appearance after fixing in ammonia, whether a weak or a strong solution be used, is in most cases pleasing.

There is no difficulty in removing the uncombined chloride of silver from the print —this seems to be very soon eliminated—but a more prolonged treatment with the ammonia is required to get rid of the organic compounds, or compound of silver, resulting from the presence originally of the two salts, chloride and nitrate of silver, and the two organic substances, paper and albumen. If left in to any considerable amount, this leads to ruddy-orange stains, or feebler general tinting produced when the print is exposed to sunlight. When, however, a little only is retained in the print, that may assume a nice cream colour, very suitable for some subjects, and it remains for time to determine whether any objectionable after-changes may arise from its presence.

I am myself so hopeful of the good behaviour of prints fixed by ammonia, that I have in the meantime laid hyposulphite aside, and may be able to report at some future date the effects of subjecting some of these to the evil influence of a damp cellar, or other adverse conditions.

I have experimented on the solubility of chloride of silver in ammonia—somewhat roughly, I admit—and have arrived at a much higher rate of solubility than given in the only quantitative statement I have met with. I find that two per cent. solution of ammonia dissolves more than four grains per ounce, or a weight of chloride of silver equal to fifty per cent. of the NH_3 present, and that seven per cent. ammonia dissolves about twenty grains per ounce, or equal to two-thirds of the NH_3 present. I may note, as a curious circumstance, that, although alkaline chlorides are solvents of AgCl, yet when we add salt, or sal-ammoniac, to a solution of ammonia nearly saturated with AgCl, the latter is copiously thrown down.

Advantages.—The advantages that may be claimed for the ammonia over the hyposulphite method of fixing prints are :—(1) Shortness of the time consumed between the toning bath, and the finishing of the print (I here show a specimen which from the time of removing it from the toning bath, until laying it down on the mount, occupied less than eight minutes). (2) Freedom of the print from any sulphur compounds ; and consequent promise of permanency. (3) Great saving of water, required for the washings. (4) Preservation of the fainter shadings, which become bleached to a great extent under treatment with the hyposulphite. (5) The cost may be less, if the ammonia and dissolved chloride of silver, and other silver compounds, be recovered by partial distillation and treatment with hydrochloric acid. (6) The paler shadings in the picture retain a warmer tint than in the hypo-fixed prints ; this in many cases will be thought, by some, an advantage, as in portraits and sunny landscapes.

Against the ammonia method of fixing it may be admitted : —(1) That a longer and more thorough treatment with the gold toning bath is advisable. (Captain Abney, it appears, finds the same to be the case when sulphite of soda is the fixing agent.) (2) That the pink or other tinted papers have the colour more or less destroyed ; but if a white paper be used, any desirable tint can be given after fixing. (3) That greater care must be taken that the sensitive paper is not exposed to much adventitious light ; any slight shade of colour it may so acquire is not bleached out by the ammonia as in the case of the hyposulphite fixing. For the same reason, the whites given by weak negatives will not be rendered so pure.

And now I may offer some remarks on the mode of using the ammonia. First, as to the strength, almost any strength may be used. On card No. 29 is given a print on a pink-tinted paper ; this, after being thoroughly gold-toned, was cut in two, the one-half was fixed in 10 per cent. ammonia, or the "solution of ammonia" of the British Pharmacopœia, having a specific gravity of 0·959—a much better standard for photographers than any of the stronger solutions. The other half of the print was fixed in $\frac{1}{4}$ per cent. solution, or fully forty times weaker, yet little difference can be seen in the results so far as the fixing is concerned, only the stronger solution has more thoroughly destroyed the pink stain that the paper originally had. Strip 1 on card No. 19 shows an attempt to fix an untoned print by means of a solution so weak as one-sixteenth of a per cent. It is really fixed, so far as the chloride of silver is concerned, but a little of some organic compound of silver has been left, and the sunshine has changed this to a buff or deep cream colour.

As to the Time required.—When only one bath is used, this seems to vary just inversely as the strength of the solution, and the downward limit seems to be five minutes for a 2 per cent. bath, ten minutes for one per cent., and so on, or time = 10 minutes divided by the number expressing the percentage strength. This, when only one print, is put into a considerable quantity of liquid, and frequently agitated ; but a longer time is necessary to secure freedom from cream tint of the whites, and can do no harm. However, I prefer using several baths, and this really shortens the time required, at least when we begin with a strong bath, and finish with a weak one.

When the silver and much of the ammonia are to be recovered it may be a good plan to use two pairs of baths, the first and second baths being the stronger, say 1 or 2 per cent. : and the third and fourth baths filled with weak solution, say of $\frac{1}{2}$ or $\frac{1}{4}$ per cent. The first bath should, after treating a few prints, be put aside for distillation, the second taking its place while a fresh second is supplied. When the third bath is judged to become impure, the liquid is to be thrown away, and the fourth put in its place and a fresh fourth provided. The accumulated liquid from the first baths may be distilled into cold water, producing a weak solution for the second pair of baths ; and when most of the ammonia has been distilled off, hydrochloric acid is to be added to the remaining liquid, to throw down the silver or otherwise, three or four baths of the same strength may be used, all being marched upwards to the position of the first, and the whole eventually subjected to the still in a way that will produce a solution of the proper strength. On this plan very little waste will occur.

When not pressed for time, and the contents of all the baths are to be thrown away, I would recommend using a one per cent. solution for the first bath, and five to ten minutes' immersion, this to be followed by baths of quarter per cent. solution.

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* Read before the Edinburgh Photographic Society.

As to the Final Washing.—If the last bath be weak and not very impure, there seems to be no necessity for after-washing at all. Nevertheless, I prefer giving the prints a final wash in water, and in the case of using pink-tinted paper it may be noted that a wash with weak acetic acid revives to some extent the colour. But it will be best to use white paper.

As to the Cost.—Since the price of ten per cent. solution of ammonia will be from 2d. to 3d. per pint, that of one per cent. may be stated at one farthing per pint.

Before concluding, I may mention that some of the ready-sensitised papers are not very suitable for the ammonia treatment, as they become pimply or tacky, so that blotting-paper cannot well be used to dry the prints. Other papers are quite free from this objectionable feature.

Should the revival of ammonia as a fixing agent meet with favour, much better results than I have shown will no doubt soon be produced. I especially look for improvement to spring from modifications of the toning bath.

CAN PHOTOGRAPHY LIE?

BY J. HUBERT.*

I ARRIVE home just in time to save my assistant from being torn to pieces by a dog sitter, whose animosity he has roused by injudiciously representing himself to be a cat, which contingency the owner had evidently not foreseen when he left operator and sitter alone in the studio. Master Felix being secured by the camera and by the owner, my services are called into requisition by the present guardian of a little lunatic, whose growing tendencies to that state of existence had made it appear desirable to remove him to more appropriate lodgings. To photograph such an object was rather novel to me, though the guardian was sure that I could represent the poor thing as a perfectly rational being. Now I was just becoming conscious that photographers did occasionally resort to a lie, but here it was forcibly brought home to me that they have a reputation for that malpractice. How dreadful! The lunatic, who, probably taking a fancy to me, had embraced one of my legs so tightly that I was divided in my perplexity whether to photograph or to get rid of him. I was, however, not to be in doubt long, for releasing my *pedes*, he seemed to think it fine fun to mount my camera stand and look into the box, as he was pleased to call it. To describe his antics would be impossible; they were many and varied. Suffice it to say that he nearly drove me to the same fate which so unfortunately had overtaken him before I had succeeded to make an impression upon him and the plate.

This state into which I had thus worked myself could not have been more unfortunate, for I had to photograph a lady next who was subject to fits, the uncertain recurrence of which at any moment might be looked for with tolerable certainty, especially under such an ordeal as photograph taking. My unfitting state at such a moment did not seem a fitting occasion to fit the camera into position without causing the fit to be communicated to the subject of fits, but I managed it.

You may ask, gentlemen, what this sitter can possibly have to do with my subject. Well, I should certainly not have thought it fitting to mention the matter here had she not been subject to St. Vitus dance as well, and as undoubtedly you will agree with me that photography as yet is not capable to reproduce this amusement truthfully, it must be a lie. If you should, however, think this statement far-fetched, and some of you gentlemen are burning to open a discussion thereon, I feel compelled to name this part as not for discussion, and proceed with lying matters more truthfully narrated. This you may think an easy matter, but it is not such for me, so, as you will probably be getting tired of my paper, I will try to get out of the difficulty by drawing the matter to a conclusion, before my whole day's work has been accomplished. This will be a pity, I assure you, because you lose the best part of it; but there being no rose without thorns, and in England not many days without rain, we must try to make the best of matters. At any rate I obliged to do so, for a group of forty bicyclists had just arrived, while the heavens began pouring forth their resources of condensed moisture in such liberal quantities that the spirits of my intended sitters were so diluted as to be quite unfit for immediate consumption under the coming ordeal. I received, however, material help in keeping them up from a member of the company, whose exclusive right to joke at the expense of all, myself included, seemed unquestioned, nor would it have been at all within the reach of probabilities that if requested to give some one else an opportunity to speak, he would have accorded that facility. His flow of language came to an end, but the rain would not follow suit, and as by this time the next important member—whose cardinal virtues did not include patience—had affected several of his comrades, some of whom had already expressed a desire to ride off, an altercation ensued, which ended in the departure of their master of ceremonies. He being out of sight it became evident that that man had been the obstacle, for Master Sol burst out from among the clouds, greeting us with one of his most sarcastic smiles, and withdrew again; but whatever other tricks he might have served us, Mr Wind prevented them, and bracing himself up majestically, blew away the clouds that had been despatched by the deceitful luminary. I took the opportunity, and prepared for action. Some little time was occupied in persuading the company to sacrifice the master of ceremonies, but eventually the matter was compromised by my conditional promise to introduce him into the picture afterwards. As this was only promise, I hoped to evade the perpetration of this lie, but being fully prepared to do it if necessary, I left room for the picture in the middle, which place I chose in preference to make the difference not too striking, as the corners not being always so sharply in focus, would hardly agree with a well-defined studio picture. To arrange a large group quickly, and obtain at the same time good expressions of most, is a matter of difficulty. It requires influence and power to impart to the company the knowledge that you are fully master of the situation. The only way to grapple with large numbers is to place part on the ground, avoiding, of course, showing the soles of the feet, part sitting behind on low forms, part standing behind these, the next part standing upon forms, and the last part standing upon tables or double row of forms. The loan of these forms from the nearest school has never been refused to me, and in this case I used them in the manner indicated. I gave each man a number, which is the best way to convey to them quickly and effectually where to look and how to hold the head. I finish up with a few words, telling the company how to avoid the usual meaningless expression, entreating them to remain steady, as otherwise my expensive plates would be wasted, besides courting certain failure, and losing time and temper. I had just readjusted the cap of my lens when a peal of thunder and simultaneous shower of rain put an end to my outdoor operations, the shock being so sudden and severe it disconcerted me so that the very recollection of it now brings my paper to a very desirable conclusion. Gentlemen, real thunder is a terrible thing; it cannot be compared to the thunder of displeasure you may shower upon me. The atmospheric disturbance accompanying the phenomena has always had special influence upon the photographer and his materials. Look upon the qualities of the dry plate makers, thunder weather productions; these lend themselves seldom to the conditions discussed in my paper, in which I have attempted to show what you all know, that photography can lie.

But I cannot agree with a member's remark of two weeks ago that this paper should have been entitled, "Can Photography tell the Truth?" I think it safer to leave that to the proposer to demonstrate. I can picture to myself the indignation of the fair sex, the horror of the swell, the revolt of old maids, and similar disasters, at the mere hint of a doubt of photography being able to tell the truth. I should recoil from the consequences of such an indiscretion, and it must indeed be a bold man to venture upon the task, which, as it stands, is almost too difficult to treat in a serious manner. I trust indeed, gentlemen, that you will therefore excuse my frivolity. I will finish in a more dignified way. As you are well aware, photography can be used at will for any purpose. By different treatment in the process, by the use of lenses of different construction, by including different angles, by negative and positive retouching, by each and all these means we can, in a more or less degree, describe an object truthfully or inaccurately. If Mr. Jack, the plaintiff, exhorts you to represent the house he built by dimensions especially suited for the purposes of making out his particular case before the injustice, I mean the Lord Chief Justice, you can satisfy the demand, and you can have it equally in your power to be as obliging if Adam, the defendant, has recourse to your services. How to wield the power you possess is the point. If you are not careful the judge may call you a humbug, if he is so disposed; and if you are over-careful you may lose your clients. But take what course you will, let me entreat you not to follow the abominable practice of retouching away all likeness of a person you may wish to beautify. Strive to represent everything and everybody to the very best advantage. If you go as far as making a mule out of a donkey, do not conjure up a horse from the original carcase of the intelligent ass. The great majority of your sitters will be satisfied if you soften the wrinkles of old age, take away freckles, conceal the loss of an eye or a leg, and prevent solarisation of a hairless crown. Those that are not you may safely disregard, and count amongst the number of enemies you are sure to create if you succeed in this life.

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* Continued from p. 221.

PHOTOGRAPHIC REPRODUCTION OF COLOURED OBJECTS WITH COLLODION.

BY C. STUREMBURG.*

Second Paper.

The basis of my process is collodion. Any kind of collodion may possibly be good enough for the reproduction of coloured objects, if treated correctly in the silver bath, but when account must be taken of the action of the less refrangible rays and the copying of warmer colour tones, it will be found advantageous to use a collodion containing nearly equal parts of iodides and bromides, and in comparatively large proportions to affect a film of such density, so as to avoid, so far as possible, a light action beyond its surface. Such collodion must naturally remain much longer in the silver bath, as bromide of silver is formed but slowly, taking longer time than that of iodide of silver. Bromide of silver has the highest sensitiveness for the less actinic rays, but it gives, with acid development, as used with the wet plate processes, satisfactory and brilliant pictures when organic substances are present. Iodide of silver gives strength to the negatives, and must necessarily be an ingredient of the collodion. Chlorides in the collodion do not act very favourably towards the reproduction of colour tones, but it seems that with them the finer gradations of shadow are much better preserved. By no means should a large amount of chlorides be admixed to the collodion, as with it the general sensitiveness of the plate is very much reduced, and consequently a much longer exposure must be given.

It is a great error to acidulate the silver bath, of ten per cent. strength, with nitric acid. To reproduce colour tones it is absolutely necessary to use acetic acid. Nitric acid is an energetic solvent for silver, and plates prepared in a bath with it are but slightly sensitive and work slowly. With acetic acid no sensitiveness is lost, and at the same time the iodide and bromide of silver remain perfectly intact in the shadowed parts. The amount of acid to be added is not so very important; two to three drops of it to every gram of nitrate of silver in solution is not excessive. Plates prepared in such a bath will never, even with the longest exposures and the strongest developers, show a trace of fog upon the negative, while, provided a suitable collodion has been used, the colour values will be truly reproduced. A bath which is strongly acid is necessary, as it allows of more energetic development than those used with ordinary collodion and bath.

Equal attention should be given to sensitizing the plate in the silver bath. The purest negatives cannot give good results if bath and collodion do not harmonize with each other, or if the collodionized plate has not received the proper treatment in the bath. Bromide of silver forming much slower than iodide, but of the utmost importance in the reproduction of the less actinic colours, positively demands that the plate should remain in the bath for a very long time, fifteen minutes, and even a longer time, being necessary to sensitize the plate.

With chloride a similar slow action is perceptible. How correct this assertion is, can be easily proved by exposing a plate prepared in a short time, and another that has remained in the silver bath much longer, upon the same object with the same time of exposure, and with all other conditions the same. The details of the pictures and the correct representation of colour will always decide in favour of the plate having remained in the bath for the longer time.

With a silver bath but slightly acid, the resulting negatives will, on longer exposures, be weak and feeble, with almost a total loss of the finer details; while, with a bath that is strongly acid, they are retained much better, provided the development has not been carried too far.

The correct employment and composition of an active and energetic developer is, without doubt, of great consequence in the reproduction of colour values. If strong, its action is speedily completed, and details, especially in the darker parts of the picture, are rendered more perfect; the shadows remain in harmony with the lights, and the prominent bright parts are not as dense in the negative as they would be with a weak developer. It is altogether an erroneous view which is entertained by many photographers, that a weaker developer will bring out a picture equally well with one of greater concentration, and that the weaker will act the same as to the quality of the negative, requiring simply a longer time of developing.

The silver deposit upon the negative plate is formed more rapidly with a stronger developer, and is for that reason not so solid or compact as when a weaker solution is used. One of the main advantages derived from an energetic developer is, that the resulting negative, provided its acidity has been properly corrected, is intense enough without subjecting it to further operations. With a strong developer work can be done in less brilliant light, and where with the usual time of exposure a weak developer would almost be inactive, good results can be gained with one of higher concentration. From this fact we may observe how beneficial a strong developer is in portraiture, and how with it the time of exposure may be reduced.

Ordinary developers contain much acid; clearness and transparency of the plate depend upon it, but that can be obtained with far less acidity than is generally thought to be necessary. There is no need of glacial acetic acid; the ordinary article will do well enough. A good formula is to take from ten to twenty parts of sulphate of iron, one hundred parts of water, and ten to twenty parts of acetic acid. By increasing the quantity of the acid, the vigor and brilliancy of the negative will increase. While the quantity of the iron should be equal with that of the acid, the proportion may be altered to advantage, so that to one part of iron, one and a half parts of acid are taken.

The stronger the developer and the less acid it contains, the more energetic its action; but its activity will increase by heating it.

Alcohol in the developer is essential when flowing very large plates, but must be added in limited quantities only. The process of developing must be carefully watched when strong solutions are used. When the picture has been well brought out, the action should be stopped at once, for a longer continuance will injure the half tones. If, after fixing, a slight intensification should appear to be necessary, chloride of gold and sodium may be used; but never employ pyrogallol and silver. Frequently a slightly coloured varnish will give the intensity required. But those negatives which have the necessary density and brilliancy through a simple development are always the best, and print invariably with all the beautiful details and half tones for which good collodion negatives are noted.

In the next and concluding paper of this series I will speak of lighting the subject, and make some remarks concerning the objectives which should be used in this work.—*Photographic Times.*

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* Continued from page 93.

Patent Intelligence.

Application for Letters Patent.

4915. William Trenemen, 10, Old Jewry Chambers, E.C., for "Improvements in the production of photographs in colours."—2nd April, 1887.

5080. John Jabez Edwin Mayall, 9, Southampton Buildings, London, W.C., for "Improvements in the production of photographic impressions."—5th April, 1887.

Patent on which the Sixth Year's Renewal Fee of £10 has been paid.

1602 of 1881. H. A. Steinhill, "Photographic objectives."

Official Abstract of Accepted Complete Specifications.

Journoud, 5793, 1886. "Using celluloid, &c., as a substitute for glass in focussing plate."

Palmer, 4965, 1886. "Coating machine: regulating flow of emulsion from reservoir; adjustable sluice on distributor; pitch chain conveyor; automatic placing in rack."

Palmer, 4965, 1886. "Coating plates: hand apparatus, with arrangement for lifting distributing tube to any required extent."

Journoud, 5793, 1886. "Using celluloid, xylonite, &c., as substitute for glass for plates and films."

Boult (*Sichel*), 3139, 1887. "Sensitive film consisting of resinates of metals or organic bases."

Boult (*Sichel*), 3139, 1887. "Sensitive surfaces consisting of resinates developed by benzol, &c., for negatives or bleachers for positives."

Heine, 5932, 1886. "Magnesium lamps: ash removed by cutter and revolving wheel; feed mechanism with pneumatic or electrical self-winding apparatus."

Specifications Published.

Lorentz Albert Groth K.G.V., civil engineer and proprietor of the Patent Industrial and Financial Agency, 30, Finsbury Pavement, London, E.C., for "A new or improved process for reproducing photos in copper-plate, lithographic, or printing presses." Communicated from abroad by Louis Collardon, Captain, of 1204, Cordoba, in the city of Buenos Ayres, Argentine Republic, South America, and Albrecht Edward Barthel, Gentleman, of 111, Liberty Street, New York, U.S.A. —Dated April 22nd, 1886.

The patentee says:—

The object of this invention is to reproduce photos in copper-plate, lithographic, or printing presses in a better and cheaper manner than heretofore by means of the common photographic press. In order to obtain such a result, the photos to be reproduced must be provided with a surface in relief, as with the ordinary smooth surface such reproduction is impossible. For this purpose a specially prepared gypsum mass, as also a specially prepared pigment paper, is required, from the latter of which a negative is taken, and which can then be used as a medium for producing an irregular surface of crooked lines and figures from the half tones. The gypsum mass is composed of 1 to 6 per cent chalk, and 50 per cent. water to each 100 parts gypsum, the latter, together with the chalk, being finely powdered and well worked with the water to obtain an homogenous mass, which is then pressed into plates of suitable size having a polished surface when dry.

The pigment paper is prepared as follows:—Common black pigment paper is placed in a bath composed of 4 per cent. bichromate of potash to 100 per cent. water for from one to five minutes, as required, and then dried in a temperature of 60° to 70° Celsius. The paper is then exposed to the daylight for from ten minutes to two hours, according to the strength of the light, and then placed in cold water for about an hour; and then in another bath composed of about 6 per cent. pyrogallic acid to 100 per cent. alcohol for about ten minutes, when it is placed in a frame or on a plate and dried. As soon as completely dry, it is covered with powdered oxide of zinc, or oxide of bismuth, which is rubbed in with the palm of the hand, thus pressing it into the deep parts, and leaving the upper parts or lines of the figures free, the surplus powder being removed.

The pigment paper thus prepared is placed in front of the camera, and a negative produced in the usual way. This negative is removed from the glass and placed between the negative of the photo to be reproduced, and a pigment paper, which has been prepared with a strong solution of gelatine containing only a small quantity of pigment, and then copied as usual, thereby producing a positive on the pigment paper with the same irregular surface as that on the negative which is necessary to print from.

The printing block is prepared as follows:—

The gypsum plate is placed under water, and upon it the positive also under water, and then the plate with the positive is removed from the water, and the positive pressed against the plate by an india-rubber roller or squeezer to remove any air that may be between, the positive closely adhering to the plate; it is then pressed slightly in a press, and then placed in a bath composed of water and 10 per cent. sulpho-cyanure ammonium or Rhodon ammonium, which will dissolve those parts which are not or only partially developed. When removed from this bath and washed in cold water it is placed in a bath composed of 5 per cent. chrome alum in water for about five minutes, then removed and washed, and immersed in a bath of concentrated alcohol and dried, and then impressed into a plastic mass composed of bone dust, albumen, blood, and silicate of soda, the proportions depending on the hardness required. Any other plastic substance may be used, such as celluloid, cyanoid, &c., by means of an hydraulic press or other suitable means, steam being introduced during the operation as is usual in filter presses. When cold it is removed from the press.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is:—

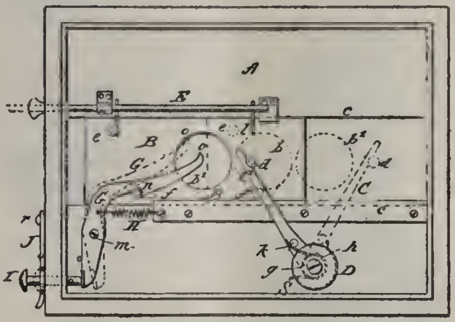
A new method of reproducing photos, consisting in the production of a peculiar negative in connection with a black pigment paper, which, after having been exposed to the light, is covered and rubbed in with oxide of zinc, or oxide of bismuth, to transform the half tones into irregular surfaces suitable for reproduction in any printing press: copying the said negative on pigment paper, and transferring it to a specially prepared gypsum plate, which is then impressed into a plastic mass composed of bone dust, albumen, blood, and silicate of soda, or any other suitable plastic substance, and then forms the definite printing block, substantially as hereinbefore described.

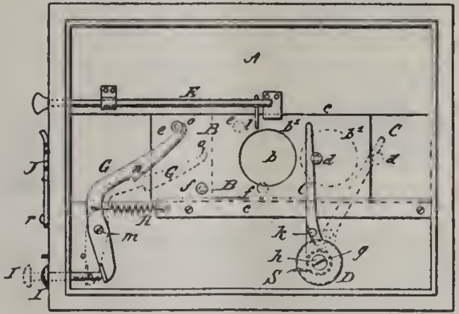
James Swift, Optician, 81, Tottenham Court Road, London, W., for "Photographic camera lens shutter."—Dated Sept. 27th, 1886.

A shutter consisting of two parallel slides working in same grooves.

Patents Granted in America.

359,797. **William H. Lewis**, Brooklyn, assignor to E. & H. T. Anthony & Co., New York, N. Y., "Shutter for photographic cameras."—Filed December 28th, 1886. Serial No. 222,789. (No model.)





Claim.—1. The combination, with the apertured shutter of a photographic camera, of a rocking arm or lever for throwing the shutter, a button secured to the camera in concentric relation with the pivot or fulcrum of said lever and provided with a circular series of notches or ratchet-teeth, and a spring arranged to engage at its one end with the notched surface of the button, and at its other end with the arm or lever, whereby the adjustment of the spring for regulating its tension is effected, around the axial line of the pivot of the lever, and an extended range of adjustment with increased facility for securing it is obtained, substantially as specified.

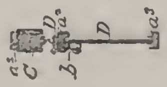
2. In a shutter for photographic cameras, the combination with the apertured sliding shutter B, having a stud or projection *d*, of the button D, of notched or ratchet construction as at *i*, and provided with a sleeve *g*, the lever C fitted so as to freely turn on said sleeve, and the spring S coiled around said sleeve and arranged to engage at its opposite ends with the ratchet portion of the button D and with the lever C, essentially as shown and described.

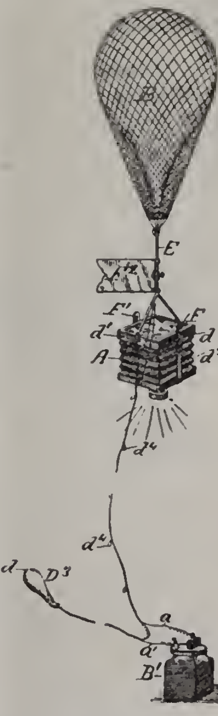
3. In a shutter for photographic cameras, the combination, with the apertured shutter B, provided with means controlled

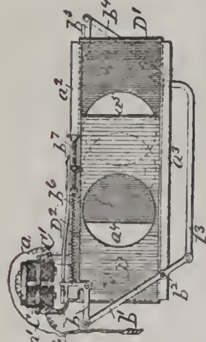
by a spring for throwing it and having studs or projections *e f*, of the sliding rod E, constructed to engage with the stud *e*, for moving the shutter against the tension of its operating-spring, the catch-lever G, having a toothed or notched portion *n*, adapted to engage with stud *f*, the spring H, and the push-pin I, substantially as specified.

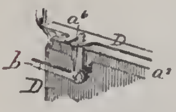
4. The combination, with the push-pin I, of an adjustable stop adapted to vary and control the inward stroke or movement of said pin, the catch-lever G, provided with a tooth or notch *n*, and having a crook *o*, upon the outer end of one of its arms, the spring H, controlling said lever, the apertured shutter B, having studs *e f* and provided with means controlled by a spring for throwing it, and the sliding rod E, having a projection *l*, essentially as and for the purposes herein set forth.

359,902. Mathew J. Steffens, Chicago, Ill, "Aerial photographic apparatus."—Filed Feb. 23, 1886. Serial No. 192,803 (No model.)









Claim.—1. In a photographing apparatus, the combination with the sides D D′, of the bell-crank lever b, the lever b', the connection-lever b^3, the lever b^4, the link b^5, and the spring b^6 whereby said slides are returned to a normal position when released from the armature D², substantially as and for the purpose set forth.

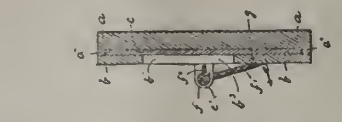
2. The combination, with the camera A and the balloon B, of the rod E, having the lower end bifurcated and adjustably secured to said camera, whereby the latter may be adjusted to bring the lens-tube to bear at any desired angle, substantially as and for the purpose set forth.

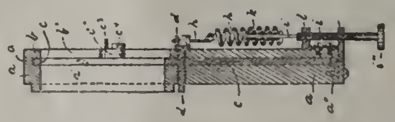
3. In a photographic apparatus of the character hereinbefore described, the combination, with a camera, of the slotted graduated guides F F′ and the tagged insulated wires or cord connecting the camera with the earth, subtantially as and for the purpose set forth.

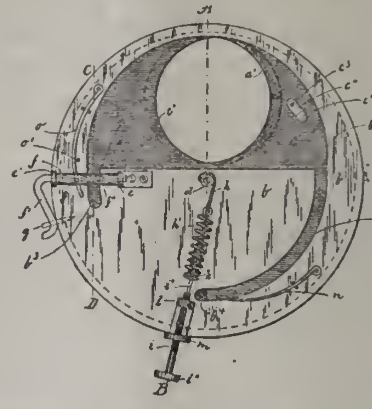
4. The combination, with the camera A, of the balloon B, the rod E, and the weather-vane F, substantially as and for the purpose set forth.

359,715. Louis A. De Ribas, Boston, Mass., "Drop-shutter for cameras."—Filed Oct. 30, 1886. Serial No. 217,568. (No model.)

Claim.—In a drop-shutter, the perforated case *a a′* and cover *b*, having cut-away portion b' and curved slots b'' b^3, in combination with the perforated shutter *c c′*, pivoted to the said case and cover, the block and projections c'' c^3 c^4 on the shutter, the holding and releasing device *f f′ f″*, spring *n*, the adjustable







regulating-screw *i*, spring *h′*, and connection *h* to the shutter-spindle, as and for the purpose set forth.

WHITENING GELATINE FERROTYPES WITH BICHLORIDE OF MERCURY.

The effects of applying a bichloride of mercury solution to photographic silver deposits are well known to all practical photographers, as mercuric chloride has in various forms and for various purposes for a long time been employed in photographic laboratories. With it we have made "magic" photographs, have bleached out prints for engraving purposes, have reduced negatives, chlorinated the deposit previous to redevelopment, and have given to collodion positives those beautiful whites, in the more developed parts, which were so greatly admired by the public.

The long-wished-for solution of the problem of making gelatine positive or ferrotype plates had hardly been accomplished, when we find one of Germany's renowned emulsionists proposing improvements on the rather unsatisfactory tones of the pictures made upon them by whitening the deposit with a solution of mercury. Gelatine ferrotypes seem to have become very popular in Germany, and, with the demand for them, naturally arose the desire to improve their appearance. Dr. Schleussner tells us that this may be done with a weak solution of the bichloride of mercury. The method of working is similar to other operations of this kind; in fact, there is nothing to be done to the plate, except to leave it in the solution until the picture assumes the desired white appearance.

The peculiar bleaching effect of bichloride of mercury upon a collodion positive was first observed by Scott Archer, and dates back as far as 1850, at which time these pictures were first introduced in Great Britain, and before any attempts with collodion had been made in America. He recommended the use of a saturated solution of the bichloride in hydrochloric acid, one part of the solution being diluted with six parts of water. After the picture was fixed and well washed, this solution was applied. The positive image was first darkened, but it speedily began to whiten, and a delicate beautiful white picture was brought out. The method described by Archer may be applied to gelatine ferrotypes, although it is advisable to reduce the strength of the solution considerably; using, perhaps, instead of six parts of water, suggested by Archer, as much as twelve parts. As one of the first conditions for a good gelatine ferrotype plate is an extremely thin film of an emulsion rich in silver, with a strongly adhesive gelatine, the reaction takes place quickly, and is completed with a solution in the proportion 1 : 100 in about two minutes. Before the mercurial solution is applied, the plate must be perfectly freed from hyposulphite of soda, an operation which, on account of the thin film, requires also but little time.

The fine appearance of the pictures, the absence of difficulties when making them, the rapidity of exposure, all warrant a general adoption of the process in a certain photographic sphere, and there is nothing seriously to be considered doubtful except their permanency.

Since we have become familiar with the working of gelatine films, the application of mercurial salts has been more or less condemned, justly perhaps in some cases, but in others without the least reasonable foundation. Negatives intensified with the salts of mercury have stood a test of several years: why may not a whitened positive, if properly made, be equally permanent?

When mercuric chloride is brought into contact with metallic silver, the latter is converted into chloride, at the sacrifice of some chlorine of the mercuric salt, reducing it to mercurous chloride (calomel), making, in all probability, the substance of the white film, a mixture of the two chlorides.

Silver chloride, as we all know, is sensitive to light, and so is calomel, especially when exposed at an elevated temperature under the influence of a moist atmosphere. Hence we must infer that the white deposit cannot be permanent, and that it is liable to change colour in a very short time. In the case of "alabastrine" collodion positives, it was not always found to do so; glass positives whitened with mercury, made thirty years ago, have retained their whiteness to the present day as well as a Daguereotype; while others again, and a greater number, have changed.

To explain these singular facts, we must consider the mode of preparing the solution of mercuric chloride. Many operators were, in the early days, in the habit of using, instead of hydrochloric acid as a solvent for the mercuric salt, a solution of chloride of ammonium, by which stability of the whitened deposit was established. If, in course of the operation, ammonia was set free, which was by no means unlikely, mercuro-ammonium-chloride, or white precipitate, would necessarily result. This precipitate is almost perfectly white; it is much whiter than calomel, which is rather of a yellowish tint, is not affected by light to any marked degree, and will stand rather a high temperature before it decomposes.

The permanency of photographic pictures can be judged of only after a lapse of time, and a mercurialized gelatine positive, with all its original brilliant whiteness, must be subjected to the same test with all other photographs. Whether a ferrotype possesees the same merits and has the same value as a silver print, or whether permanency is for these a conditio sine qua non, or otherwise, we will not attempt to decide. Mercuric chloride gives beautiful effects to gelatine ferrotypes, and, if carefully made, these ferrotypes will retain their beauty for a reasonable time. Let us not decry their beauties because there is a doubt of their permanence, but enjoy them rather while they remain.—*Photographic Times.*

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Correspondence.

SPILLER'S PHOTOGRAPHIC POEMS.

Dear Sir,—As I was probably the only man of photographic tendencies who, in the year 1859, rejoiced in the name of Spiller, I write at once to disclaim the authorship of the "Photographic Poems" which come in for adverse criticism in your current number.

Some kind friend sent me a copy at the time, by which I know that the author was C. C. Spiller. Not being of a poetical nature myself, I perhaps failed to appreciate the sentiments expressed in the work coming under Mr. W. Jerome Harrison's review; at any rate, these poems did not emanate from—Yours truly, John Spiller.

DALLMEYER'S STANDARD OF RAPIDITY.

Sir,—Mr. Debenham's letter simply amounts to a repetition of what has been said by him in previous communications, and to which I have already fully replied, and I think it unnecessary, therefore, to carry this discussion with him further in your columns. As *Mr. Debenham* cannot understand the concluding paragraph of my last letter, I may tell him that its sense grammatically and logically is, that I have shown his arguments to be as inconsistent as I find now, they are interminable.

I am pleased that the subject has been taken up by Mr. Wheeler, and I cordially agree with him in inviting the views of other opticians. Th. R. Dallmeyer.

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Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 7th inst., **Alex. Cowan** in the chair.

Photographs of the recent ballet at the Westminster Aquarium were shown by A. L. Henderson, who, in answer to queries, stated that an ammonia emulsion plate had been employed. The stage was illuminated with electric, lime, and gas light, and exposures of one second and half a second respectively were given.

A question was read regarding the validity of any patent for stripping films, and opinions were expressed for and against; diaphanous paper manufactured nearly thirty years ago being instanced by one speaker.

A twenty-five year old silver print was passed round for examination by F. W. Cox, to show its good state of preservation.

Reference was then made to the subject of phosphorescence in emulsion photography, recently revived in the photographic journals, and experiences were related and conjectures offered in explanation.

S. G. B. Wollaston was elected a member of the Society.

North London Photographic Society.

A meeting was held on the 5th instant, at Myddelton Hall, **J. Traill Taylor** in the chair.

A question was asked as to the composition of sulpho-pyrogallol.

F. W. Cox replied that Mr. Berkeley's original formula was one ounce of pyrogallic acid, four ounces of sulphite of soda, nine ounces of water, acidified with a little citric acid.

A. **Mackie** believed that the Platinotype Company's solution was acidified with sulphurous acid. He found in practice that two ounces of sulphite of soda to one ounce of pyrogallic acid was sufficient.

E. **Clifton** had been experimenting with meta-bisulphite of potash in place of the sulphite of soda. He found that it preserved the developer from oxidation admirably, but that a considerably larger quantity of the alkali was required, as it contained free acid.

L. **Medland** showed some photographs of snow scenes, also some instantaneous views of the boat race; he also exhibited a light and portable tripod stand made by Horne and Thornthwaite.

A question was asked whether any member had had experience with the mercurial intensifier, using sulphite of soda solution instead of ammonia.

It was the experience of several members that sulphite of soda did not give as much increase of density as ammonia.

The **President** then gave a concise and interesting account of the latest improvements in stripping films.

It was announced that the next meeting would be held on the 19th instant, and would be a lantern meeting. Visitors are invited.

Photographers' Benevolent Association.

The Committee met on Wednesday, the 6th inst., when the following were elected members of the Association:—W. Budd, J. Blakey, — Cobb, A. C. Clement, L. England, T. E. Freshwater, H. J. Gifford, F. Hambly, W. H. Hyslop, F. Ince, L. Kidd, J. D. O'Connor, C. Pearce, A. C. Rees, J. A. Randall, H. Scott, W. Strickland, C. H. Trinks, — Tompsett, S. G. B. Wollaston, C. A. Watkins, and Miss M. Coulden.

Mr. **Bedford** made a suggestion that honorary members should have the right of nominating deserving cases of non-members for the consideration of the Association.

After some discussion on the subject it was decided that a special committee meeting be held to fully discuss the matter.

Edinburgh Photographic Society.

The sixth ordinary meeting of the current session was held in George Street, on 6th April, **Charles Fraser** in the chair.

The minutes of the last meeting were read and approved. Nine candidates for admission as ordinary members were elected, and several nominations were made for election in May.

Robert H. Bow, C.E., read a paper on "The Fixing of Silver Chloride Prints by Means of Solution of Ammonia" (see p. 234), and illustrated his remarks by a large number of silver prints made in the course of his experiments.

A discussion followed in which Mr. Brebuer, Mr. Fraser, and others took part. A vote of thanks was accorded to Mr. Bow, who shortly replied on one or two points.

The **Chairman** intimated that in deference to an unwritten law of the Society, Mr. Forgan had placed his resignation of the Presidency in the hands of the Council. He was about to enter into trade in connection with photography, and, as the members were aware, this had hitherto been regarded as a disqualification for the office; but it had been arranged that Mr. Forgan should retain his position till a suitable successor had been appointed.

A discussion took place upon difficulties occasionally met with in toning silver prints, in which a considerable number of the members engaged.

Two questions were proposed for discussion at next meeting, viz., a good test for endurance in silver prints, and a good means of intensification.

The iris diaphragm as applied to lenses, and a curious old bath camera for wet plates, were exhibited by J. M. Turnbull.

Newman's patent shutter was exhibited and explained by J. Steele.

A large platinotype print of a group of distinguished professionals and amateurs, taken at Derby during last year's convention, was laid upon the table, and for which J. Wardale had kindly presented an oak frame. It is to be hung in the council room.

A. **Inglis** also presented a large parcel of stereo slides of an interesting description.

Dundee and East of Scotland Photographic Association.

The monthly meeting was held in Lamb's Hotel, Dundee, on the 7th inst., F. **Macdougald**, Vice-President, in the chair.

A very interesting series of lantern slides illustrating the new Tay Bridge was exhibited by F. C. Caffin, C.E., resident assistant engineer. The slides were from negatives taken by Mr. Caffin during the construction of the Viaduct, and illustrated in a very vivid manner the vast difference in apparent stability betwixt the old and new bridges. As each slide was thrown on the screen, Mr. Caffin described the process it illustrated, and a great deal of information was given as to the construction.

A number of slides were then exhibited by Messrs. Ireland, Mathewson, and Baird.

The first outdoor meeting for the season was arranged to take place on the 25th of May.

Talk in the Studio.

Photographic Society of Great Britain.—The next ordinary meeting of this Society will take place on Tuesday next, April 19th, at 8 p.m., at the Gallery, 5a, Pall Mall East, when a paper will be read by James Cadett, "On Dallmeyer's proposed alteration of the standards for lenses of the Photographic Society of Great Britain."

Gelatino-Bromide Paper for Contact Printing and Enlarging.—Marion and Co. send us sample rolls of two qualities of paper that they are now putting on the market: one with a smooth surface, and the other with a rough face like that of drawing paper. Such rolls are specially useful with exposing machines of the Fontayne or Schlotterhoss type.

The New York Photographic Exhibition.—The *Photographic Times* says:—"The pictures cover all the available space in the larger of the Ortgies' galleries, and present a very attractive appearance, creditable to the hanging committee, who had only one day in which to do all their work. Frames of striking colour on novel design are used as centres to divide the walls into more or less strongly marked panels, and the whole effect is very pleasing. About 1,150 prints are shown in 392 frames by 93 exhibitors. There are also 123 lantern slides by 13 exhibitors, and 12 transparencies by 3 exhibitors. There are 19 exhibitors from Philadelphia, 38 from New York, 17 from Boston, 10 from England, 1 each from Austria and Prussia; the remainder from various places in this country. Seven ladies are represented by excellent work tastefully framed. Platinotypes, bromide paper, carbon prints, blue prints, are represented; but of course, the usual silver prints are in the majority. Owing to the limited time for hanging, &c., the judges were delayed in making their report, which was not completed at the time of writing. Lantern exhibitions are held Monday, Wednesday, and Friday evenings. A very good feature of the exhibition, and one which shows considerable enterprise on the part of the managers, is the catalogue, giving names and numbers of the prints. This will be a valuable souvenir."

Photographic Club.—The subject for discussion on April 20th will be "Development."

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

C. E. Webber.—As far as we know, there is not any reason to suppose that prints made on such paper are more liable to fade than albumen prints in general.

Chas. A. Pawler.—Thank you for the suggestion, which shall be considered; and we will then communicate with you.

J. C. J.—The old talc does no harm; but sometimes the gelatine appears to take firm hold of the glass, and the fresh talc will not adhere to these places. In such a case, soaking in a pickle of sulphuric acid and bichromate of potassium (two ounces of each to a pint of water) may be necessary, followed by a thorough washing. Should you find talc to be unsatisfactory, try waxing the glass, the following being the method of working: Clean the plate by one of the usual methods, and dry thoroughly by allowing the plate to remain for some hours in a warm place, after which heat it to a temperature a trifle over the melting point of wax, and rub one side (marked) with a piece of genuine unbleached bees-wax, when the excess is to be polished off with a pad of flannel. Several waxings and rubbings off are desirable in the case of new glass, but a very short re-waxing operation is required each time the glass is used after the first time Can you give us any experiences of the earthquake from a photographic point of view?

F. Mack.—Your communication should have been addressed to the editor of the publication in which the letter appeared.

Ne Cede Malis.—No. 4 is undoubtedly the best, and it does not interfere with the use of the diaphragm. Still, it is a delicate piece of clockwork, and requires careful handling.

C. B.—We really cannot tell you why Mr. Harrison mentioned those he did mention, and failed to mention those which you would have liked him to mention; but we are quite sure that he would be in no way influenced by the circumstance of any of them advertising or not advertising in the Photographic News, or in any other publication.

L. R.—If put in the market at a low price, there should, we think, be a very good sale for it.

B. Brown.—We do not know the address.

W. Goebelhoff.—See two articles, the first of which appears on page 645 of our volume for 1884.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

Vol. XXXI.—No. 1494.—April 22, 1887.

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22.4.87

THE NEW YORK PHOTOGRAPHIC EXHIBITION.

Report of the Board of Judges.

The undersigned, a jury of awards, in presenting their report, desire to state that they have reached a realising sense of the seriousness of the task before them. Had this realising sense come sooner, it is doubtful if the subscribers would now be struggling with the problems that so cantankerously refuse to be solved in any way that is likely to be satisfactory to everybody. The time has been far too short. The material offered in exhibition has proved far too rich to be lightly disposed of.

The questions of art and technique have opened such wide and far-reaching vistas with so many interesting side issues, and complications, and cross considerations, that it has seemed at times almost impossible to reach conclusions that could be clearly stated or satisfactorily explained.

Some work has commended itself because evidently directed by a fine sense of picturesque composition of line or effect, while technically it fell far below almost perfect photographic specimens that, although without art feeling, were too good technically to be passed without commendation.

Your Jury have ageed that the highest aim is one that reaches above the precision of chemistry or mechanics, and gives expression to the subtle spirit that pervades all nature, whether in landscape or figure.

To them this exhibition is rich in promise, and bright with many examples of promise realised.

The professional photographer who studies it in the true spirit of growth must find much that will tend to enlarge his boundaries, and the amateur cannot fail to be more deeply than ever enamoured to this fascinating combination of science and art.

Attached hereto are the names of the exhibitors to whom the jury have awarded diplomas, with such explanatory comments as the subject seemed to demand.

James D. Smillie.
George C. Cox.
E. Wood Perry, Junr.
C. Y. Turner.
George G. Rockwood.

Awards of Diplomas.

Frank M. Sutcliffe (professional photographer), Whitby, England. One diploma for the entire exhibit. Reasons: "The board considers it the best general exhibit of technical skill, combined with artistic treatment as to composition, gradation, and tone."

F. P. Cembrano (amateur), Richmond, England. One diploma for No. 314.

J. Prime Loud (amateur), Boston, Mass. One diploma. Reasons for the above two awards: "The poetic treatment of landscape composition in which the fine technical skill is lost sight of in the beauty of the pictures."

Geo. B. Wood (artist and professional), Philadelphia, Pa. One diploma. Reasons: "Best choice of subject and composition."

Frederick A. Jackson (amateur), New Haven, Conn. One diploma.

John L. Stettinius (amateur), Cincinnati, Ohio. One diploma for series.

T. H. Emerson (amateur), Chiswick, England. One diploma. Reasons for above awards: "Best selection of motive and management of delicate gradations, that render the simplest subject full of interest."

John E. Dumont (amateur), Rochester, N.Y. One diploma.

Alfred Clements (professional), Philadelphia, Pa. One diploma.

Professor Henry A. Rowland (amateur), Johns Hopkins University, Baltimore, Md. One diploma.

Roberts Redfield (amateur), Philadelphia, Pa. One diploma.

John G. Bullock (amateur), Philadelphia, Pa. One diploma.

J. P. Gibson (professional), Hexham, England. One diploma. Reasons for above awards: "Best technical excellence, with much artistic feeling in choice of subject."

Horace A. Latimer (amateur), Boston, Mass. One diploma. Reasons: "Best photographs from paper negatives."

John L. Stettinius (amateur), Cincinnati, Ohio. One diploma for pictures entitled "The Jumper," "The Diver."

Walter A. Clark (amateur), New York. One diploma. Reasons for above awards: "Best examples of instantaneous photography."

Franklin Harper (amateur), New York. One diploma. Reasons: "Best interiors."

C. W. Canfield (amateur), New York. One diploma. Reasons: "Best blue prints."

P. H. Mason (amateur), Peekskill, N. Y. One diploma. Reasons: "Best enlargement by an amateur."

John Bartlett (amateur), Philadelphia, Pa. One diploma.

G. West and Sons (professionals), England. One diploma.

J. G. Sinclair (amateur), West Hartlepool, England. One diploma. Reasons for all above awards: "That they are good technically."

Mrs. Robert W. de Forest (amateur), New York. One diploma. Reasons: "Best ladies' exhibit; especially good for choice of subject and technical excellence."

Miss Evelyn Welsh (amateur), New York. One diploma.

Miss Elizabeth A. Slade, New York. One diploma.

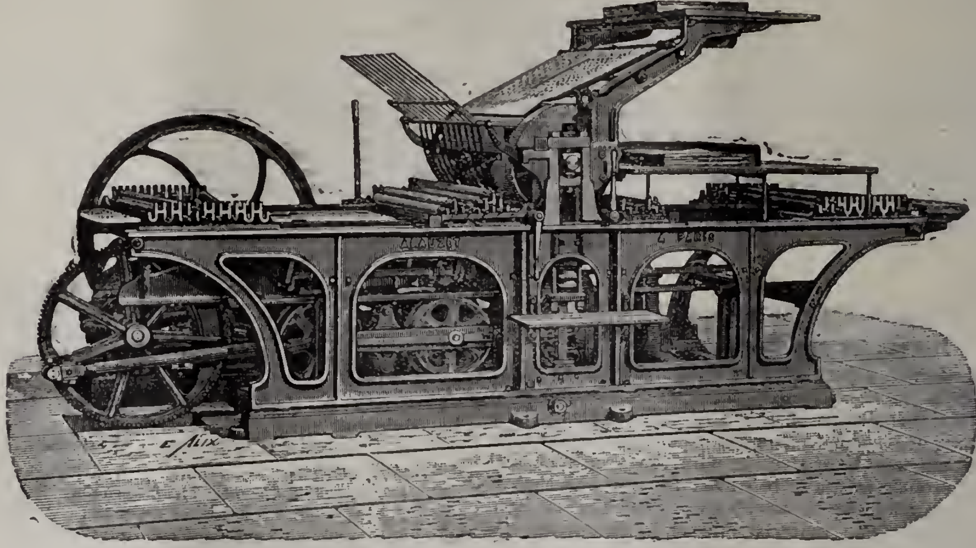
Reasons: "Second best ladies' exhibit; good selection of subject."

Robert S. Redfield, Philadelphia, Pa. One diploma for best set of six lantern slides.

Frederick Jackson, New Haven, Conn. One diploma for best transparency.

COLLOTYPE PRINTING AT THE POWER MACHINE.

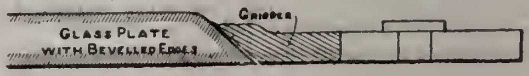
We recently gave some particulars concerning the printing of collotypes at the machine, and now we are in a position to give some of the details of working, as supplied by Alauzet and Co., of Passage Stanislas, Paris, to those who have occasion to use their machines.



The above sketch shows the general features of the Alauzet machine, and it may be looked at in connection with the description which we gave on pages 129 and 177.

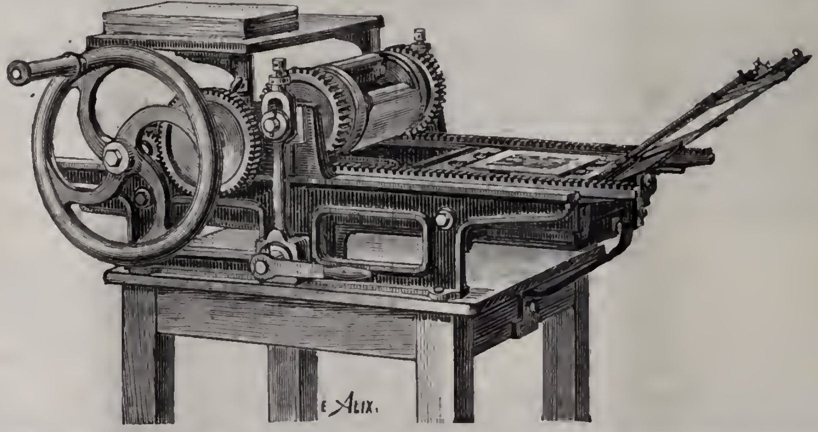
We can pass over the preparation of the plates, this matter having been so recently dealt with in the Photographic News.

Adjusting the Plate on the Machine.—First it is necessary to make sure that the back of the plate is completely free from adhering gelatine, and from any other foreign body which might cause it to fracture under the pressure of working, after which a sheet of white paper is cut to the exact dimensions of the plate, and this sheet is interposed between the iron bed and the plate. As soon as the operator is satisfied that the plate is in the required position, and that it is perfectly square on the bed, the glass is fixed by grippers such as those shown by the subjoined cut, and it may be noted that glass plates with



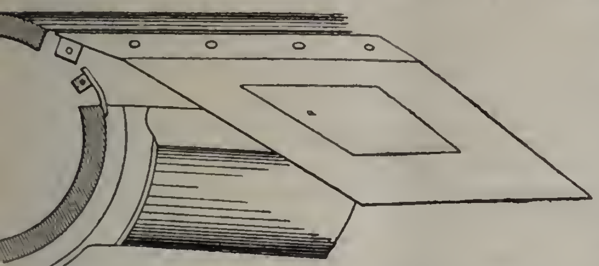
bevelled edges must be used.

The adjustment as regards height is a very simple matter, as gearing for this purpose is provided, and one has simply to operate the gearing until the top of the plate is level with the guage rules of the machine.



The Clothing of the Cylinder.—As it scarcely ever happens that pressure is required to be exercised over the whole surface of the collotype plate, it is convenient to clothe the cylinder with a pad corresponding with the actual area to be printed, and this pad consists of paper packing about 3 m.m.—say an eighth of an inch—in thickness, a sheet of india-rubber cloth being stretched over all.

The Frisket Sheet or Mask.—The pad on the cylinder serves to some extent to shield the edges of the paper from soiling, but in addition a mask or shield having an opening cut to the exact size of the picture is required; this is fixed to the cylinder in the position shown in the sketch below, and by means of a gripping piece provided.



As each sheet of printing paper is laid on, the mask must be turned back. Most persons prefer to use oil paper, or some other form of waterproof paper for the mask.

Alauzet and Co. also construct a small collotype press for printing by hand, this being represented by the third cut on the preceding page.

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TO BE SOLD BY AUCTION.

BY A PHOTOGRAPHIC PATRIARCH.

The announcement of the sale of the "cameras, lenses, photo apparatus, the property of the late Dr. Diamond, of Twickenham," at Stevens's Auction Room last Friday, attracted me. Dr. Diamond's name had a sort of fascination about it. It carried me back to the very early days of the Photographic Society, when photography was the scientific toy of the upper classes, and when every new discovery was ushered in with a banquet. Dr. Diamond's apparatus, I fancied, would be worth seeing as characteristic of those days. On the whole, I don't think I was disappointed.

I must confess the look of the buyers puzzled me. There once was a time when you could tell a photographer by his soft felt hat with broad brim, and his unkempt beard. So far as I could see, there was not a soft felt hat in the room. The majority of the crowd had that mysterious seedy look, seen only in auction rooms. One gentleman interested me; he wore a suit of navy blue, with a coat too long for a pea jacket and too short for a frock. He had a yachting cap on his head, and his face gave one the impression that he was a dealer in second-hand furniture who had joined a yachting club. He did not look in the least like a photographer, nor could he be suspected of a tendency towards microscopic slides. I should like to have known what he bought, but as it was impossible in most cases to find out who bought and who did not, my curiosity was not gratified. The vast majority of the buyers were habitués, and did not shout out their bids, but indicated their wishes to the auctioneer by cabalistic signs.

Four Chinese gentleman were notable personages. Three of them I had once seen at the Photographic Exhibition, where the apparatus seemed to attract their notice more than did the photographs. They were privileged persons, and admitted into the sanctum where the lots were stored, and from which they—the lots, not the Chinese gentlemen—were brought to be knocked down to the highest bidder. One of the Chinese gentlemen bought for a few shillings an aluminium watch and chain, but I don't think any of them bid for Dr. Diamond's effects.

Lot 85 began this particular portion of the sale, for the apparatus of the first secretary of the Photographic Society only numbered fifteen items. Lot 85 was a large mahogany camera, described by the compiler of the catalogue—who evidently had a notion that the length of a camera added much to the value, for the length was put down in every instance—as being "32 inches by 18 by 15." It turned out to be 12 by 10, for the outside measurement only had been taken. It was brass-bound, had a clamped double-swing back, and was altogether a most formidable looking affair. The cameras of to-day are mere cobwebs in comparison to those first made, and to look at this unwieldy box, as solid as a house, with its brass bindings at every two inches, one is inclined to speculate whether the early photographers, in despair at their failures, were accustomed to dash the camera to the ground, so that it had to be made sufficiently strong to stand their ebullitions of temper.

The useless weight and waste of good wood once indulged in, now appear very absurd, and nothing is more marked in photography than the difference in the cabinet work of to-day and that of thirty years ago. The brass-bound camera, including an oak studio stand, went for £3 5s., certainly not dear.

Lots 86 and 87 were ordinary cameras of the solid wood type, and lot 88 was described as a portable camera, its portability consisting in the fact that it had a leather handle screwed on the top. I do not know what it weighed, but I am certain that a modern landscape photographer would shudder at the idea of carrying it a couple of miles. Together with a Ross's lens and a tripod stand it fetched £3. Lot 89 was something of a curiosity—a folding camera and Voigtlander lens in a leather portmanteau. The folding camera certainly went into very little space, but must have been four times as heavy as a modern travelling camera for the same sized plates. It did not seem to excite much enthusiasm, and only realised, tripod and all, £2. Lots 90 and 91 were comparatively modern cameras and lenses, and I need say nothing about them, nor also about lot 92, a miscellaneous collection of printing frames, baths, dishes, shovelled into a large box.

The last lot I looked at with curiosity, as it seemed it should, if it were genuine, give rise to some competition. This was lot 98, described as an "old lens belonging to M. Daguerre, a curiosity." It was a single lens about two-and-a-quarter inches in diameter, and Daguerre's name was written on the woodwork to which the flange was attached. I fondly expected the auctioneer would have dropped into eloquence over this relic, after the style of the late George Robins. But no; there was no intimation that Daguerre was the father of practical photography, that but for his discovery probably neither the crowd nor the acutioneer would have been there that day. The auctioneer showed not the least emotion, and announced lot 98 in the customary mechanical tone. The dusty piece of glass mounted in the old-fashioned brass cylinder was not taken at any sentimental value. "Five shillings," started the auctioneer. "Six—seven—eight." A pause. Surely this relic was not going at eight shillings! "Nine," "ten," "eleven." "Eleven," repeated the auctioneer, looking round. A dead silence, and down fell the hammer. Daguerre's lens sold for eleven shillings! It was incredible, and I pushed my way out of the crowd, wondering sadly at the lack of reverence displayed by photographers. Surely one of the societies might have bid another shilling and secured the treasure! Even converted into a snuff-box or an inkstand, and used at every meeting, it would have been worth preserving. But perhaps the societies did not know of the sale. I will give them the benefit of the doubt.

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Reviews.

The Art of Photographic Painting. By A. H. Bool. Price 1s. (*London: Piper and Carter, 5, Furnival Street, Holborn, E.C.*)

The author of this little book is considered to be a successful practitioner of that which many photographers look upon with a considerable admixture of disapproval—the colouring of photographs. He gives such manipulatory details as will serve to enable the pupil to overcome the special difficulties incident to the application of colour to photographs; and in the chapter on oil painting he instructs in such fashion as to selecting and working of the colours, as should materially assist anyone who either wishes to paint over a photograph, or to make a coloured copy in oil paints.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTE.

BY CHAPMAN JONES.

Chapter V.—Peroxide of Hydrogen—Ozone—Carbon in its Various Forms—Its Uses as a Pigment—Its Oxides—Sulphur—Sulphuretted Hydrogen—Sulphurous Acid—Sulphuric Acid.

Peroxide of hydrogen is water with a double amount of oxygen (H_2O_2), and is exceedingly convenient as a source of oxygen that may be mixed with aqueous solutions, and has none of the disadvantages of either acids or alkalies. It cannot be obtained in a pure condition, unmixed with water, and the strength of commercial preparations is expressed by the number of volumes of oxygen that are liberated by boiling a unit volume of the liquid. That ordinarily sold is "twenty volume."

A very dilute solution of this reagent is useful for decomposing the last traces of hyposulphite of soda, or of sulphites that may remain in a photographic film, when the minute quantities of these that cannot be washed away would be deleterious to a subsequent operation. Sulphite of soda is oxidized into sulphate, thus:—

$$Na_2SO_3 + H_2O_2 = Na_2SO_4 + H_2O$$

and hyposulphite into an acid sulphate thus:—

$$Na_2S_2O_3 + 4H_2O_2 = 2NaHSO_4 + 3H_2O$$

the sulphates that are produced being harmless.

Oil paintings that have become discoloured or dingy through a part of the white lead having changed into sulphide of lead, can be restored by the action of peroxide of hydrogen, which oxidizes the black sulphide into the white sulphate of lead, thus:—

$$PbS + 4H_2O_2 = PbSO_4 + 4H_2O$$

When peroxide of hydrogen is mixed with certain other things that are oxidizers, a mutual decomposition ensues, and oxygen gas is evolved. Oxide of silver, permanganate of potassium, and black oxide of manganese are decomposed in this way. This action is exceptional.

Peroxide of hydrogen as commercially supplied has generally a slight acid reaction, for in that condition it is more stable.

Ozone is a condensed and peculiarly active form of oxygen always to be avoided as detrimental to sensitive surfaces and apparatus. It is produced by electric discharges under certain conditions, and it is well to exclude all electrical apparatus from photographers' store rooms or dark rooms, except perhaps incandescent lamps, and the wires that lead to them.

Carbon is one of the most unalterable of things, for it has never been melted nor volatilized, and it appears to be quite insoluble.

The diamond, which is the hardest substance known, and graphite, which is so soft that one's skin or soft paper is hard enough to act as a file upon it, are both essentially carbon. Charcoal, lampblack, soot, &c., are other less pure forms of carbon. Animal charcoal has a still greater proportion of matters that are not carbon, and is obtained by heating bones or animal refuse with exclusion of air. It is variously known as bone black, animal black, ivory black, &c.

These various forms of carbon have many uses. An uncut diamond, conveniently mounted so that one of its edges projects, forms the usual instrument for cutting glass. A fragment of a diamond mounted, with a sharp corner projecting, is useful for scratching or writing upon glass.

Graphite is commonly called "black lead," and every one is familiar with its use in coating (black-leading) iron work, and in pencils. Amorphous carbon has a more extended application as a pigment. Mixed with diluted varnish it may be applied to almost any surface to give a coherent, dull black coating, and by re-varnishing with uncoloured varnish, a brilliant black surface is obtained. Metal articles are preferably warmed before treatment. Starch-paste may be used instead of varnish for blackening the insides of cameras. The tinctorial matter of ordinary printers' ink is lampblack. In carbon printing, too, carbon is used; and as nothing is less amenable to change, we may regard it as permanent. Generally, however, it is necessary to modify the tint by adding a second pigment which is somewhat changed by exposure to light. Lampblack is the commonest form of amorphous carbon, but the soot deposited upon a cold surface by a gas flame, or the flame of a benzine lamp, is much finer.

Animal charcoal is an efficient and innocuous decolouriser, useful especially in bleaching lac varnishes, for it is not safe to employ lac bleached in the ordinary commercial way, lest it should be contaminated with the acid used.

Carbon combines with oxygen in two proportions, forming carbonic oxide (CO) and carbonic anhydride (CO_2).

Carbonic oxide is produced when ordinary fuel burns with an insufficient supply of air, as is often the case in close stoves. It is a combustible gas that burns with a blue flame with the production of carbonic anhydride.

$$CO + O = CO_2$$

Carbonic oxide is highly poisonous.

Carbonic anhydride (CO_2) is the product of the complete combustion of carbon, and is not poisonous in the ordinarily accepted sense of the word, but is, on the contrary, very essential to our well-being. An undue accumulation of this, as of any other gas, is injurious, and should be guarded against by good ventilation. The unpolluted air contains about 4 parts of carbonic anhydride in 10,000 volumes, and respired air from 3½ to 4 per cent. It is produced by the combustion of carbon, respiration, fermentation, decay, or by the action of an acid upon a carbonate. An acid and a carbonate cannot exist side by side; they will always react together with effervescence, because of the liberation of the gas under consideration. The base of the carbonate forms its corresponding salt with the acid used; for example, hydrochloric acid and sodium carbonate produce sodium chloride, carbonic anhydride, and water, thus:—

$$2HCl + Na_2CO_3 = 2NaCl + CO_2 + H_2O$$

Carbonic anhydride is soluble in an equal bulk of water. It is feebly acid. It combines eagerly with caustic alkalies, not neutralising them, but reducing their caustic nature. It is an active agent in the rusting of iron, and polished steel will remain untarnished for years in an atmosphere, however moist, if carefully freed from carbonic anhydride and other acid substances.

The compounds that sulphur enters into are among the most useful that the photographer has at his disposal. It is only to those who are ignorant of the facts of the case that this element is invariably viewed as an enemy. It occurs widely distributed, in the free state, in combination with metals, and in many other compounds, of which both albumen and gelatine are examples.

Sulphur itself is a yellow, brittle solid, which burns without difficulty, and is of no immediate use to us. Its compound with hydrogen, sulphuretted hydrogen (SH_2), is occasionally useful, but must be rigorously excluded from any apartment where sensitive material is stored, and from albumen silver prints, either in a finished condition, or at any stage of production. The ordinary silver print when subjected to the influence of this gas, rapidly fades to the yellow colour that is so familiar. The sulphides of sodium, potassium, and ammonium give off sulphuretted hydrogen copiously when any acid is added to them

$$(SAm_2+2HCl=SH_2+2AmCl)$$

and are decomposed slowly by exposure to the air; these reagents should therefore be carefully guarded. The characteristic odour of rotten eggs, that is decomposing albumen, is due to sulphuretted hydrogen.

When sulphur burns, it produces sulphurous anhydride (SO_2), a heavy gas with an odour that was better known when matches were tipped with sulphur. Water dissolves about forty times its volume of sulphurous anhydride, and gives a liquid that has acid properties. This solution is referred to when sulphurous acid is prescribed for developers. It is one of the most uncertain of preparations, varying in strength as at first obtained, and rapidly changing afterwards, not merely deteriorating in strength by the loss of some of the dissolved gas, but absorbing oxygen from the air, and becoming sulphuric acid, thus:

$$SO_2+O+H_2O=H_2SO_4$$

The comparative amount of sulphuric acid in two or more samples of sulphurous acid may be roughly estimated by taking a dram of each sample, adding to each, with agitation to thoroughly mix, a dram of hydrochloric acid, about two ounces of water, and a solution of barium chloride in small quantity, but until the maximum turbidity is produced. The turbidity is proportional to the amount of sulphuric acid present. The mixture that has the strongest smell of burning sulphur may be considered to indicate that the sample of sulphurons acid it was prepared from is the strongest.

Sulphurous anhydride can easily be liquefied by cooling it with ice and salt. It can be obtained commercially in "syphons," somewhat similar to those used for aerated waters, and this is by far the most convenient and certain way to get this compound and the preparations obtainable from it. It would, however, be very unsafe for anyone not accustomed to chemical operations to have to deal with liquefied sulphurous anhydride.

Sulphuric acid is the most stable of these compounds of sulphur. It is produced in a dilute form by the spontaneous oxidation of sulphurous acid as noted above, and a similar method of preparation is pursued commercially. Sulphurous anhydride, got by burning sulphur, is mixed with air, steam, and a small proportion of nitric acid fumes in a large leaden chamber with a shallow layer of water upon its floor. The sulphurous anhydride, steam, and oxygen of the air combine according to the above equation, to produce sulphuric acid, and the action is made rapid by the nitric acid, which readily gives up some of its oxygen, leaving a lower oxide of nitrogen. The nitric oxide resulting, has the property of spontaneously combining with the oxygen of the air, and of at once parting with the oxygen it has combined with to the sulphurous anhydride and water, re-forming nitric oxide, which reacts again, and so continuously. One charge of nitric acid fumes would thus be sufficient for preparing any quantity of sulphuric acid if loss could be altogether avoided. The weak acid produced in the chambers is concentrated in leaden pans, and then in glass or platinum vessels as far as possible, to produce the "oil of vitriol" of commerce.

The photographer should always use the sulphuric acid known as "pure," and if this is obtained from a respectable firm, it may be relied upon. It should be colourless; a slight brown tint is probably due to a little dust. It must be kept in a properly stoppered bottle, for it rapidly takes up any moisture that gets to it. It is a more powerful drying agent than chloride of calcium, but, being a liquid, and highly corrosive, it is not so convenient. The strong acid rapidly chars wood, paper, &c., and, as it is not volatile, it is dangerous to use for clearing prints, &c., unless its application is followed by a thorough washing. Any dilute acid left in the paper remains; it keeps itself dilute because of its eagerness to combine with water; but its charring power is brought into play when it is concentrated by a gentle heat. A secret ink that was sold some time since was nothing whatever but very weak sulphuric acid, and the writing was made visible by warming till the acid blackened the paper. Parchmentized paper is made by plunging unsized paper into sulphuric acid mixed with a little water, and, after a few seconds, washing it thoroughly.

Dilute sulphuric acid acts readily upon zinc and iron, and the hot strong acid corrodes all the ordinary metals; gold is not affected by it. Sulphuric acid is used in the preparation of hydrochloric, nitric, acetic, formic, oxalic, and citric acids; alum, corrosive sublimate, and many other common chemicals.

THE COMIC SIDE OF PHOTOGRAPHY.*

BY CHARLES E. PEARCE.

Following Mr. *Punch's* hits at photography, it is curious to note how his satire gradually shifts from the photographer to the sitter. As a novelty, photography had to endure plenty of jests made at its expense, but when the public got used to it, jokes on technical peculiarities and artistic shortcomings began to lose their point. There was, of course, much to ridicule. Artists turned up their noses at the mechanical process, and denied that it could possibly be the medium of artistic feeling. The great majority of those who practised photography were men who saw its capabilities for making money, and took it up for no other reason. It was the refuge for the destitute. Showmen, acrobats, bird fanciers, members of the band at the minor theatres, hairdressers, stationers who were not doing very well, found photography a pleasant and profitable adjunct. If you were lucky enough to have a shop built out from the front of your house you were assured of a comfortable income. You at once purchased some old conservatory lights at a builder's materials yard, pieced together something like a studio, and if you could not succeed in letting it you turned photographer yourself. In such times as these there was naturally much food for fun both in the photographers and their productions.

By-and-bye these early photographers began to have artistic aspirations, and the attempts of the ambitious in the way of pictorial effect were fearful and wonderful. As we have already seen, up to the end of 1864 *Punch* was satisfied with the material to laugh at he found in photography. In March, 1865, appeared the last of his satirical hits at the operator—well deserved, as we must all now admit—and for some years afterwards his shafts were directed against the sitter, whose vanity and foibles became more pronounced than the defects and peculiarities of the photographer. The satirical picture (one by Keene) mentioned, touches upon the artistic ambition which in those days so often overleaped itself. It is headed "Art and Nature," and shows a young lady in the usual crinoline, sitting by the side of a table which supports her elbow, her chin resting lightly on her hand. She is saying: "Oh! I think this position will do; it is easy and natural." Photographer: "Oh! that may do in ordinary life, ma'am, but in photography it is out of the question entirely." This, of course, assumes that the position of the young lady in the picture is artistic as well as "easy and natural," and that the poor photographer was blind to the fact that an artistic pose involved ease and nature. If the draughtsman has not succeeded in fulfilling these three conditions, his satire is pointless. Keene's drawing must have looked much better in 1865 than it does in 1887. We were then not alive to the ugliness of crinoline.

Keene's drawing in May of the same year is a harmless bit of pleasantry. The scene is in the studio of a barber-photographer, and the surroundings are evidently sketched from nature. Country photographer (*removing cap from lens*): "Quite steady now, sir, if you please" (*not so easy*

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* Continued from page 132.

with a lively wasp threatening your nose! and the negative is a failure!). The expression of the sitter—a bucolic looking old gentleman, sitting broadside to the camera, and holding a big fluffy chimney-pot hat in his hand—under these trying circumstances, is exquisite. It is a year before *Punch* again makes use of photography. "Pleasant for Simpkins," is the heading of a drawing in June, 1866. Photographer (*to Mr. Simpkins*): "Keep your head steady, please, sir, and look in the direction of those young ladies." Mrs. S. (*by a look that Mr. S. quite understands*): "Just let me see him wink!" No one can draw a comically-agonised look better than Keene, and he is at his best in the delineation of the miserable Simpkins.

The portrait of Private Giglampz, who has distinguished himself at Wimbledon, and takes the opportunity of making his twenty-fifth distribution of cartes-de-visite to his friends, may be passed over as only of interest in marking the period when the Wimbledon camp was an exciting novelty. The next notice of photography is one out of a series of four illustrative of childish language, and entitled "Choice Specimens of Early English." Papa, mama, and the children are being photographed on the lawn by a professional operator, and just at the critical moment Master George, seeing the dog, which has been squatting near the camera, about to move, exclaims, "Hi! look at Pug. You had better stop where you are, Pug! betterent he?" This sudden burst by one of a group at the instant of exposure has riled many a photographer. The culprit is not always a child.

One of Dumourier's earlier efforts appears in July, 1867. His style assimilated slightly to that of Leech, who, indeed, was copied more or less by all the comic artists of that period. It is called "Encouragement of Art." A flunkey is standing for his portrait, and another is looking on. First curled and proud darling (*to photographer*): "You'd better take pains with these 'ere cartes-de-visite, as they'll be a good deal talked about." Second curled and proud darling (*on the sofa*): "Yes, particularly in the hupper suckles—get you customers, you know." The subject is quite Leech's, and the footmen are such as he would have drawn. Dumourier, however, was more versatile and more humorous twenty years ago than he is now. His drawing in March, 1869, is very comic. A very ugly little man is saying, just as he removes the cap from the lens, "Now ladies, if you please, look straight in my face while I count fifteen, and pray do not laugh!" Of course, the fun in this lies in the drawing of the photographer. Keene, in August, 1870, laughs at the ritualists, who were then coming to the front through the medium of photography. "The Rev. Allen Rochet has his photograph taken in full ritualistic fig," says the legend, "to present to his flock." County photographer: "The heyes might be helevated a little higher, your reverence." The picture of Mr. Rochet with two of his fingers stretched out is not a bit more absurd than the photographs of a certain worthy bishop of to-day, who has really been taken for the purpose which Dumourier has ridiculed.

In a drawing by Miss Bowers in December, 1870, there is a sly hit which photographers who now retouch to excess might take to themselves. Lady (*who is rather plain*): "My dear Cecil, when you have your photograph taken, you should always go to a good place where the man is an artist. I had mine done the other day, and it is quite beautiful!" Unfortunately, the moral of this, from the public's point of view, favours retouching and beautifying. A half-page picture in December, also of this year, headed "The Penalty of Greatness," foreshadowed what has really come to pass. It represents a certain young Scotch nobleman who married an English princess, flying before a small army of photographers who have waylaid him in a forest, and are securing likenesses from points of the compass. Celebrities of the present day have realised this kind of persecution too often.

THE BIBLIOGRAPHY OF PHOTOGRAPHY.

BY W. JEROME HARRISON, F.G.S.[*]

List of authors in Class I., printed books, showing the dates of publication of their books.

Dates within brackets refer to various editions of the same book.

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[*] Continued from page 215.

[†] In the case of books published without author's names, the date of the first edition only is given.

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Omitting books published anonymously, we have in the above list the names of 169 authors who have contributed to the literature of photography. The works of Hunt and Abney stand out prominently from their number and importance. Hardwich's book, with its nine editions, has been irreverently styled the "photographer's bible;" on the art side H. P. Robinson is *facile princeps;* while the Tissandier claims attention for the beauty of its illustrations. Monckhoven and Dallmeyer are the only writers in the list who take the optics of photography for their sole subject. Historically, the three books by Daguerre, Talbot, and Archer mark epochs in photography; they are all three scarce and difficult to obtain. Rorke is our sole poet. For photo-micrography we must consult Maddox (in Beale's work), Davis, and Malley. But it may be safely said that there is not a single writer here named from whom something may not be learnt, and the list is a goodly one, for an art which will not celebrate its jubilee till 1889. This list of authors' names will, I hope, serve as an index to the names of books given under their respeccive years, which have appeared in the following numbers of the Photographic News for the year 1886:—

Jan. 1, 29; Feb. 19; April 16, 30; June 4; July 9; November 19; December 3; or quoting the pages, 9, 65, 113, 242, 274, 361, 436, 749, 779.

Notes.

The War Office, taking a hint from the French military authorities, has issued instructions that under no circumstances are persons to be allowed to make sketches or take photographs of military structures without express permission. These instructions have been issued to officers in charge of troops, and especially where there are fortifications and earthworks.

A new form of argument took place at the Photographic Society on Tuesday. During the discussion on the respective merits of the Society's method, and of Dallmeyer's method for arriving at a standard for lenses, J. Cadett, the champion of the new plan, challenged W. E. Debenham, the champion of the old plan, to work out on the blackboard a diaphragm by the two methods. The President was disposed to ignore the challenge, observing, with a touch of humour, that it was sometimes convenient to be deaf; but the meeting was inclined to see the matter fought out, and so Mr. Debenham proceeded to accept the challenge. Whether Mr. Debenham's demonstration satisfied the audience we do not know, but it was clear it did not satisfy Mr. Cadett, who was proceeding to exact a further trial from Mr. Debenham when the President put his veto upon further catechisings by observing that the matter had gone far enough.

Those readers of papers who use blackboard and chalk at the meetings of the Photographic Society are considerably handicapped. At the first touch with the chalk the blackboard flies a little way backwards, and shakes on its central pin, giving the reader an idea that the board and stand are about to tumble over into the corner; and, unless the speaker happens to be an old hand, and knows that the blackboard is not really likely to fall over, he is made uneasy, and generally clutches the top of the blackboard with one hand while he writes with the other; and, if he is portly, his writing is thus nearly eclipsed. The old-standing chalk difficulty seems to have progressed a stage, as, in addition to the venerable chalk pencil which will not make any mark, there was, on Tuesday last, also provided a large and unsightly lump of a kind just capable of making a faint mark.

During the first hour or so of the meeting on Tuesday last the Assistant Secretary was very constantly occupied in rushing up to the speaker, taking from him the chalk which would not mark, and giving him the piece which would mark a little; but at last he put the spurious chalk into a drawer, thus reducing the speaker to the alternative of taking the better sample, or going without.

A series of twenty-three photographs of Olympia, executed by G. P. Cartland, of Windsor, at the request of the Queen, serve well to illustrate the immense step forward made by the introduction of the modern dry-plate.

Without this, one could hardly have expected to see a sharp, clean, and well-exposed photograph of a group of six athletes supported on the shoulders of two others—the photograph having been made in a building only moderately well-lighted.

Some of the photographs showing feats of horsemanship are likely to be useful studies for the artist, but perhaps the pictures most likely to please the public are the group of three baby lions, and the very remarkable series showing the elephants going through their performances.

Not long ago we published an article upon the production of positives in the camera by the gelatino-bromide process, and we indicated the most essential conditions for insuring success in this class of work. Just now we have to hand from Joseph Gray, of 56, Westgate Road, Newcastle-on-Tyne, some remarkably successful examples of glass positive work, made on plates of his own manufacture. Indeed, we had to look twice to make sure they were not collodion pictures. Mr. Gray is a pioneer in connection with ferrotype and positive work in gelatine, and our readers will remember our reference to his work about two years ago.

Professor W. M. Conway is carrying out an idea of great promise in connection with the Liverpool Art Gallery. Here will shortly be exhibited a number of photographic reproductions of Raphael's pictures, arranged chronologically, and illustrated by a full explanatory catalogue. This is a happy notion, capable of almost indefinite extension. The exhibition of any one painter's works in their completed form is practically impossible; but, with the aid of photography, its accomplishment is perfectly feasible. Hosts of pictures are shut up in private collections and in foreign galleries, and are quite unattainable to the average Englishman. He would, of course, prefer seeing the originals, but when this is out of the question, he may well be contented with photographs. From an artistic and educational point of view, the multiplication of such exhibitions as the one at Liverpool is much to be desired. The revolution which isochromatic photography has started in the copying of the pictures will, it is to be hoped, assist towards this end.

Conversing with a well-known etcher the other day, he expressed his obligation to photography in no stinted terms. The saving of time and the greater accuracy in regard to details, he remarked, were enormous. This was especially the case with regard to pictures in private galleries. To copy these in the ordinary manner would entail many visits and much labour. But, by using a photograph of the size of the intended etching, he not only shortened the time and expense, but was able to render the picture more faithfully. A study of the original was of course absolutely necessary, because the colours were not always translated in the right proportion by photography; but, apart from this, a photograph gave him all he desired.

A story reaches us from America, in which the photographer was the puzzled person. A lady entered a studio and expressed a wish to have her portrait taken in a standing position. The photographer was slow as well as fastidious, and the preparations took so long that the sitter became tired. While the photographer was focussing, he saw to his horror the lady sit down. Of course had she sat upon a chair there would not have been anything astonishing, but what frightened the photographer was that she sat upon nothing! Had his sitter been Peter Schlemil, the shadowless man, he could not have been more terrified. He withdrew his head from under the focussing cloth, when the lady, seeing no doubt his bristling hair, said reassuringly, "I daresay you are surprised, Mr. Tripod, but I felt a little fatigued with standing so long, so I sat down for a moment on my patent dress-improver folding chair." The photographer had not heard of the latest combination of ingenuity and fashion.

The ghastly use to which the French Police put photography savours somewhat of the tortures of a byegone age, when suspected criminals had "confessions" extorted from them by means of the rack. There is something very horrible in the idea of an accused person being taken in the dead of the night to the place where he is supposed to have perpetrated the crime, and having his already unhinged nerves worked upon by the sudden production of photographs of the murdered persons taken after death, and with the hideous evidence of that death plainly visible. This is the course which has been adopted with Pranzini, who may be guilty of the two murders with which he stands charged, but who, if innocent, may well show fright at being placed face to face with such horrible details. We fancy that if this practice were introduced into England, the outcry against photography would be louder than that which brought the Burmese amateurs into notoriety.

Our public personages are threatened with a new penalty—the extreme of celebrity. It is stated that photographs have been taken of the President of the United States and Mrs. Cleveland on Sundays, while they sit in their pew at church, by indefatigable artists who, armed with "detective" cameras, locate themselves in the gallery. If this practice be universally adopted, our celebrities will be afraid to go to church, because it is obvious from the enforced stillness which one is expected to observe in a place of worship, that a photographer has a good chance of securing a likeness, even when the light is bad. It is, we are afraid, not possible, even with the most sensitive plates, to secure portraits of the preacher while pouring forth his impassioned eloquence. This is a pity, from a commercial point of view. Portraits of Spurgeon, Dr. Parker, Canon Farrar, and other popular men, taken while in the pulpit, would have an enormous sale. The first-named preacher was indeed taken some twenty years ago in the act of preaching; but then he posed himself for the purpose, and a *facsimile* of the rostrum in the Tabernacle was erected in the studio.

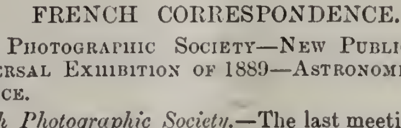
A correspondent is in a difficulty. He writes:—"I am about to go to France, and shall probably be there some time. I am going to take my photographic apparatus (English make), and I have been looking over the catalogues of the French dealers so as to make sure I can easily replenish my stock of dry plates. What puzzles me is this. I can't buy the size of the plates advertised to correspond with the sizes of my carriers. To begin with, each maker seems to have his own scale, but certain measurements are common to all. Take the following: —9 by 12, 11 by 15 13 by 18. These numbers, I presume, represent so many centimetres, but I cannot by any system of calculation make them correspond with our quarter-plate, 5 by 4, and half-plate sizes. Do the foreign makers ignore English requirements, and work on their own system? If so, would it not be wise if English and Continental photographers came to an understanding, so as to have a uniform scale of measurements?"

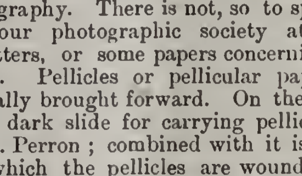
FRENCH CORRESPONDENCE.

French Photographic Society—New Publications—Universal Exhibition of 1889—Astronomical Conference.

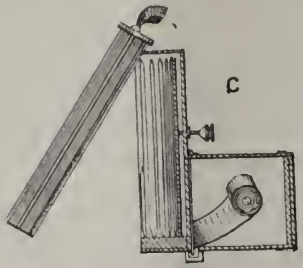
French Photographic Society.—The last meeting of this association has been much occupied by various communications, amongst which, however, there are few that present great interest. Two leading ideas run through all the investigations of the day. These are, in the first place, the bringing to perfection of the manufacture and use of pellicles and of pellicular papers; and in the next place the progress yet to be realised in the practice of instantaneous photography. There is not, so to speak, a single meeting of our photographic society at which new exposure shutters, or some papers concerning them, are not presented. Pellicles or pellicular papers are also being continually brought forward. On the last occasion a new kind of dark slide for carrying pellicles has been shown by Mr. Perron; combined with it is a box with a roller upon which the pellicles are wound up as they have been exposed. The pellicles are in the first instance placed flat in the dark slide, where they are inserted between the layers of a band of black paper folded as shown at A. Each fold of the band of black paper carries a guard upon which the pellicle is cemented at one end. This cementation is in our opinon one of the weak points of Perron's system, for it is difficult to prevent creases from forming, in consequence of the expansion resulting from the cementation. When one piece of pellicle has been exposed, a button is turned on the roller, which winds up the exposed pellicle and the band of black paper just so far as to bring a new pellicle into the proper place for the next exposure. The diagram B shows the arrange-

A





ment of the roller slide. Figure C gives a more complete idea of the system as a whole. One drawback of the arrangement—which, however, we cannot deny possesses some ingenuity—is the interposition of a plate of glass between the pellicle and the lens. We prefer a direct action of light without such interposition. Doubtless means will be found to perfect this new method, which is certainly not without merit. M. Londe has submitted a fresh communication relative to measuring the speed of instantaneous shutters. In his opinion the best method consists in the employment of a tuning fork giving 1,000 vibrations per second, which permits of a rapid estimation of the duration of the movement of any shutter. Without dwelling on this special point of the question, we will here merely note the conclusion formulated by M. Londe relative to the impossibility of obtaining a scientifically comparative measure of the speed of different exposure shutters, unless we operate with a source of light of equal intensity at each experiment. He points out that in operating upon objects differently lighted, different results will be arrived at. According as the light is more or less powerful, the period of inertia—that period during which the luminous rays have not yet produced any effect capable of being developed—is longer or shorter. In this M. Londe is right theoretically speaking, but from a practical point of view it appears to us that there is not much in it. In practice, in fact, instantaneous subjects are photographed in a good light, and it is with a good light that experiments with shutters should be made, using the same means throughout. This may not be rigorously scientific, but it is sufficiently practical, and we don't require anything further.



New Publications.—M. Henry Gauthier-Villars, eldest son of our sympathetic editor of photographic works, has just translated the interesting manual of Dr. Vogel on orthochromatic photography. This fresh translation should popularise amongst manufacturers and photographers the knowledge of this important question of isochromatism, and in further spreading its employment. The day will come, and is not far distant, when ordinary plates will no longer be used, except for that class of subjects which are simply black and white, or for reproductions of monochrome. With this exception—that is to say, for all reproductions of polychrome subjects—only isochromatic plates will be used. The beautiful results already realised in this direction, scarcely opened as yet, are a sure guarantee of future promise. M. Agle has just published at Gauthier-Villars' a practical manual on instantaneous photography. This is the second work of this kind which has been published here, and it is, at the least, a proof of the importance which is attached to this mode of reproduction, so useful to the learned, and to artists. This book is interesting, but we find nothing in it specially to be quoted. It is full of practical information from which photographic amateurs may derive much profit.

Universal Exhibition of 1889.—The organisation of this great artistic and industrial manifestation proceeds with rapidity. The works of the installation are continued without relaxation, requests for space flow in, and the room occupied by the exhibitors will be double that which they filled in 1878. The committees of admission have been constituted for each of the diverse classes. The committee of photography has elected its bureau as follows:—President, M. Davanne; Vice-President, M. Levy; Reporter, M. Leon Vidal; Secretary, M. Audra. Everything leads us to suppose that the French photographic exhibition will be very brilliant; and it is to be hoped that the same will have to be said of that of the other nations who join in it. We have arrived at a period when it becomes of very great interest to bring together and group, on the one hand the divers technical photographic processes, and on the other the numberless applications that have been made of light pictures to the sciences, to arts and to industry. In our opinion it would be proper to have separate classes for each of these applications, so as to bring out more strikingly their importance and diversity.

Astronomical Conference for Photography of the Sky.—On the 16th of April this conference is to open, but up to the present we do not, so far as France is concerned, see any invitations except to astronomers. Now as not only astronomy, but more especially photography, is in question, it cannot be that the astronomers, however competent they may be, should be especially *competent photographically* equally with those who consecrate their entire existence to the theoretical and practical study of photography, as is done by so many remarkable *savants* in England, by Dr. Vogel in Germany, Dr. Eder in Austria, &c. It would be surprising if no French specialists should be called to sit in this conference, whilst we know that Dr. Eder has been delegated to it by his government in conjunction with Mr. Weiss, the director of the astronomical observatory at Vienna. What has been done at Vienna should be done by each state participating in the conference; that is to say, the work should be divided between astronomers and photographers. A complete understanding from the purely photographic point of view is certainly that which is of the most importance, if we are determined to produce a work which cannot be questioned, and which can defy the lapse of many years. Perhaps a wiser line of conduct will yet be decided upon, but we doubt it. There are too many members of the Institute to allow of an official recognition being given to the admission of simple mortals having no other merit than that of a profound knowledge of photographic science. Foreigners alone will benefit by this admission, and once again the strict truth will be shown of the proverb that no one is a prophet in his own country.

LEON VIDAL.

Patent Intelligence.

Applications for Letters Patent.

5308. SAMUEL HERBERT FRY, Fairfield Villa, Kingston-on-Thames, Surrey, for "Improvements in giving rigidity to flexible photographic films."—12th April, 1887.

5488. HARRY WHITFIELD, 68, Broad Street, Birmingham, for "Improvements in holders, clips, or easel for photographs, mirrors, photograph frames, cards, and other articles."—15th April, 1887.

Provisional Specification Accepted.

3652. NORMAN SANDERSON BROWN, 163, High Street, Kirkaldy, for "Improved marker or counter for attachment to photographic printing frames."—10th March, 1886.

Patent on which the Ninth Year's Renewal Fee of £10 has been paid.

1448 of 1878. S. W. ROUCH, "Photographic camera."

Official Abstract of Accepted Complete Specifications.

BEARD, 7344, 1886. "Magic lanterns and dissolving-view apparatus: runner working in grooves in carrier pushes forward slide, actuates centering levers, and withdraws previous slide on return."

MCKELLEN, 7951, 1886. "Cameras (including lenses and lens fittings): adjustable and detachable guide rails to take different sizes of dark slides and allow them to be inverted."

Caldwell, 8010, 1886. "Change boxes and slides: storage dark box from which plates in frames are extracted for exposure by sliding cover over them.'

Specifications Published.

3269. William Thomas Morgan and Robert Leamon Kidd, Photographic Paper Manufacturers, Kew Foot Road, Richmond, Surrey, for "Stretching or straining paper photographic films, &c."—Dated March 9th, 1886.

The instrument consists of a rectangular framework made of metal or any suitable substance. On each of its sides is hinged a strip of hard metal slightly wider than the framework The outside edge of each strip and the inside edge of framework are turned up to form a rim, and are so arranged that when the hinged strips are closed down on their hinges their rims fit tightly or snap over the rims of the framework beneath. The hinged strips are indented, ridged, or corrugated, so that the ridges, &c., project from their underneath surfaces, and on closing on to the framework touch its corresponding surface, which is provided with indentations, &c., to receive them, immediately before the edges of their rims overlap

The instrument is so designed as in one movement to grip the borders of the paper to be strained, and to stretch it from all four sides, and with the same movement to press it up to any required plane.

Correspondence.

THE BIBLIOGRAPHY OF PHOTOGRAPHY—ADDENDA.

Sir,—The thanks of all those interested in the literature of photography are due to Mr. W. J. Harrison for the very exhaustive compilation he has made of the works relating to photography. I see that Mr. Harrison, in his article on the "Bibliography of Photography" appearing in the issue of the Photographic News for April 8th, 1887, invites the readers of the News to make known any corrections or omissions that may be required to make the list of photographic works thoroughly complete. Accepting this invitation, I would suggest that under the year 1845 Fox Talbot's "Sun Pictures in Scotland" be added to the four books specified by Mr. Harrison. For the year 1846, while it would appear that no single work bearing on photography has been published during that year, still I think a reference should be made to an article that appeared in the *Art Union Journal* for that year (June 13th), entitled "The Talbotype." A specimen of the Talbotype was given with the number of the journal in which the article appears. I have been fortunate enough recently to secure this number with its accompanying specimen print. The chances are that the writer of the article—which, by the way, is a very exhaustive one—would be Talbot himself.

In 1851 Archer published in the *Chemist*, in the March number, details of his collodion process. I think this fact should be noted in the bibliography of that year.

In 1863 the fifth edition of "Ure's Dictionary of Art, Manufactures, and Mines" was issued, the editor being Mr. Robert Hunt, author of the well-known "Researches on Light," &c., and in the third volume of the Dictionary will be found two articles, one on Photographic Engraving, and the other on Photography. Doubtless some of the previous editions had similar articles, but I merely call attention to the fact that the edition which I have before me as I write has two considerable contributions devoted to photography.

Most of the leading cyclopedias will all be found to contain something relating to photography, but I have not the material beside me to be able to go into this matter in detail. One very important contribution which I see Mr. Harrison does not take notice of is the article on photography in the Encyclopedia Brittanica. When it is mentioned that Captain Abney is the contributor, it will be well understood that it is a thorough exposition of the subject. The volume containing this treatise is the 18th of the present edition of the Encyclopedia, and was issued in 1885.

Referring to what Mr. Harrison says regarding Giphantie, I would like to ask that gentleman if the translation he refers to as having seen has really the date 1761, for from some remarks I find in the second volume of the Photographic News, I have had my faith shaken in this Tiphaigne de la Roche.

In the Photographic News for June 10th, 1859, the Paris correspondent calls attention to a book that had just been published, "Le Vieux-Neuf, or Ancient History of Modern Inventions and Discoveries," by a certain Edouard Fournier, and in that work Tiphaigne de la Roche's forecast regarding photography is given at length. From the manner in which the Paris correspondent of that date refers to it I was inclined to think that, after all, Tiphaigne and his prophecies had emanated from the brain of Monsieur Fournier. It is a point well worth clearing up, and I shall be glad to hear further what Mr. Harrison has to say to it. Has anyone seen the original Giphantie, published in 1760?

Under Photographer's Note Books I would add a publication that has been going on for several years, and is still flourishing—viz., *The Photographer*, published by Messrs. George Mason and Co., of Glasgow. It is a monthly epitome of what is being done in the photographic world, and has something more than a mere local circulation.
W. Lang, Junr., F.C.S.

Dear Sir,—Will you kindly permit me to point out that in Mr. W. Jerome Harrison's "Chapters in the History of Photography," he has omitted to include in his catalogue of works on photography my "Moon as shown by Photography," published in 1858 and 1859. Two editions of 1,000 each were sold, illustrated by a photograph of the moon, and a description of its surface. So far as I know, I can only find a single copy of it now, which I should be glad to send for Mr. Harrison's inspection. I was at that time occupied at the Hove Observatory, in carrying out my views as to an entirely new method of producing stereoscopic combinations of the moon.—Very truly yours,
Samuel Fry.

DALLMEYER'S STANDARD FOR RAPIDITY.

Sir,—The discussion on a proposed alteration of standard for lenses has occupied so much of your space, that I will not now trespass further upon it than to put before your readers the paragraph in Mr. Dallmeyer's letter of April 1st, which I was unable to construe, but the grammatical and logical character of which he upholds.

"In conclusion, it will be consoling to Mr. Debenham that in publishing a certain method *in connection with the Photographic Society's Standard*, that he did not suggest that standard itself, for, although he has come forward to defend it, he has entirely failed in his object; and, furthermore, by italicising the sentence in his last letter: '*it is the diameters of the stops by which we take our measure*,' and in comparing lenses in his previous letter, *without the slightest reference to their aperture or diameter* (as I have before pointed out), it is evident that Mr. Debenham's line of argument must fall through, for it is neither by the one measure nor the other that we 'take our measure' for comparison, but by the ratio of the diameter of the stop or controlling aperture of the lens, to the equivalent focal length of the lens."
—Yours truly, W. E. Debenham.

SPILLER'S PHOTOGRAPHIC POEMS.

Dear Sir,—Seeing the correspondence on "Photographic Poems," I beg to say I knew the author, who was Mr. C. C. Spiller, bookseller, &c., of Holborn Hill. He had a son who was a clever operator (I am speaking of the year 1862), so probably there was another man who rejoiced in the name of Spiller in 1859, for photography was not learned in a few months in those days.—Yours truly,

Leicester. Alfred Newton, Photographer.

PHOTOGRAPHIC EXHIBITION IN AUSTRALIA. AN INVITATION.

Dear Sir,—Will you kindly allow me space to inform members of the many English Photographic Societies, that the Annual Exhibition of the Victorian Amateur Photographic Association will be held in Melbourne in the beginning of July next.

I am authorized to invite contributions from British Photographic Societies, the committee guaranteeing the utmost care of all exhibits, either returning the same, or, if so desired, will exchange print for print for Australian pictures.

Book and parcels posts to the Australian Colonies now render transition inexpensive, easy, and, with careful packing, quite safe.

I trust this opportunity of extending the right hand of photographic fellowship will not be allowed to pass without result, and that it may prove but the introduction to future courteous interchanges between the societies of the mother country and those of the colonies.

All communications and consignments (which must leave not later than the last May mail) should be addressed to the Hon. Sec., Mr. J. H. Harvey, 83, Gore Street, Fitzroy, Melbourne, Australia.

I shall be most happy to supply any further information, and am, yours obediently

Edward W. Purton,

(Custodian Amateur Phothograpic Association of Victoria,)

59, *Rochester Road, Camden Road, N.W.*

Proceedings of Societies.

Photographic Society of Great Britain.

The ordinary meeting of this Society was held on Tuesday, the 19th inst., at the Gallery, 5a, Pall Mall East, James Glaisher, F.R.S., President, in the chair.

Minutes of the last ordinary meeting having been read and confirmed, J. R. Gotz and Col. R. Maldon were elected members.

A paper was then read by J. Cadett on "Dallmeyer's Proposed Alteration of the Standard for Lenses of the Photographic Society of Great Britain."

J. Cadett commenced by disavowing an intention of bringing forward anything new, as the subject had been fully discussed quite recently in the pages of the Photographic News. He was one of the committee on diaphragms and standard screws appointed by the Council in 1882, and feeling an interest in the matter had prepared his paper. The question now arose, could they adopt a better unit, and they were told by Mr. Dallmeyer that they could. If that was the case, it should be done. Dallmeyer's proposed standard of unity was fixed at $\frac{1}{\sqrt{10}}$ (see Photographic News, September 24th, 1886, and Supplement February 18th, 1887), instead of $\frac{f}{4}$ the P. S. G. B. standard of unity. Thus, if the proposed standard be adopted, instead of sixteen being the divisor, the system would become decimal. Calculation were then made upon the blackboard in illustration, and it was contended that $\frac{f}{\sqrt{10}}$ was much more simple in practice. The proposed system, being a decimal one, was more scientific, and he not only wanted the Society to adopt it as the standard, but all other societies at home and abroad; and if the Photographic Society of Great Britain adopted the decimal system, foreign societies would be more likely to take it up. At first sight the figures looked rather awkward, but he would show that such did not hold good.

W. E. Debenham premised that a standard that has the authority of the Society's recommendation, and that has been adopted in consequence, should not be altered except for weighty reasons, or manifest superiority in the one proposed to take its place. There being three distinct cases in which the use of the standards may be compared, it would be well to see which case was of the most importance as requiring ease and simplicity of calculation, and compare the accepted and proposed standards with respect to each case. The case of first importance was that of the use in the studio or field of lenses or stops which have been previously marked with a number in relation to the standard. This is of first importance, because of constant occurrence, whereas the marking should be done by the optician or photographer himself at home, and once for all. In this case, the only difference favours the accepted standard, the proposed standard requiring numbers about half as large again as those at present in use. This practical advantage of the present standard, he said, had been admitted by Mr. Dallmeyer, who, however, considers it but a small one. Nevertheless, the only objection of any weight that has been made against the Society's standard is that the numbers are, when using small apertures, already high. The second case for consideration was that of forming a set of apertures of sizes to bear simple numbers in relation to the standard in use. To do this, it became necessary to first obtain a dimension representing the standard aperture, and then divide this aperture as required for the smaller openings. The Society's standard aperture is obtained by dividing the focal length by four; with the proposed standard the divisor is the root of ten, or 3·162, &c. It was obvious that in this case of obtaining the sizes for the standardized diaphragms, the present standard was far more convenient than the proposed one. The third case was that of comparing apertures that have not been cut to any standard, and numbering them in accordance with the standard. This was a case which might be expected to become more and more rare, and eventually die out, as diaphragms are cut to bear a simple relation to the standard in use. Indeed, it was worth while, on account of simplicity of calculation, to have diaphragms re-cut where need be, so as to enjoy that simplicity. When irregular openings have to be compared, there are two methods of doing it. The method considered the simplest and easiest in most cases for those who are not opticians or mathematicians is the graphic method, and for this method a unit has to be obtained as before by dividing the focal length by 4 for the Society's unit, or 3·162, &c., for the proposed one. If, however, the arithmetical method be adopted, the focal length must, for either standard, be divided by the aperture, and with unregulated opening, both divisor and dividend will probably include several decimals. The quotient must then be squared, and where the number is high, all this is such a lengthy operation that subsequent division by 10 or 16 is comparatively trifling. In concluding, he (Mr. Debenham), submitted that any advantage presented by the proposed standard was far outweighed by its disadvantages in the other cases referred to.

J. R. Gotz believed the present standard answers very well indeed. It gave photographers a simple reading of relative exposure, and he hoped the Society would keep to their present standard, for it was doing good work. He thought he was the first to carry out the method in a practical manner, for he found that nobody would have a lens from him except it was arranged upon that standard, and many of those lenses previously sold had been returned to be altered, which showed that the system was appreciated. It gives the simple reading for relative exposures, 2, 4, 8, and so on, and he doubted whether the decimal system would be so readily understood. In foreign countries people are more used to the decimal system than here. But in this country more lenses are made and shipped than in any other part of the world, therefore, as English opticians have the pull, there was no need to trouble about the decimal system as a gift to foreign countries. The Society's system was a simple one, and he hoped they would not establish the other.

S. G. B. Wollaston thought it should be remembered that although it was but a short time since the standard was adopted, a large number of lenses had been constructed to suit the special requirements, and if the Society set the example of altering their system, everyone else might do the same.

G. L. Addenbrooke supported the existing standard, and pointed out that in practice the figures 8 and 128 would be the limit in most cases, and perhaps a little too much had been made of the decimal system.

W. Bedford, as a member of committee of standards, thought that hardly sufficient had been made of the point that it was the wish of the committee that the system should be adopted in its entirety, and that lenses should be numbered by the uniform system. If that had been done, there would have been no occasion for revisions of the standards. Then the fact of the system being considerably adopted, and English lenses largely introduced in America and elsewhere on the Society's standard, ought to weigh with the Society before they altered the standard.

T. R. **Dallmeyer** then dealt with the points raised by the various speakers, in which he maintained his system to be simple and efficacious, and he expressed his willingness to debate the subject of uniform standards should the Society eventually refer the matter to a committee of leading opticians.

J. **Cadett** replied on some points raised by Mr. Debenham, and these gentlemen were accorded the privilege of again demonstrating their respective arguments in figures upon the blackboard.

The **Chairman**, in closing the meeting, called for a vote of thanks to Mr. Cadett for bringing the subject forward, as he was sure the Society wished their standards to be useful; but when an influential committee deliberated time after time upon this subject, he did not think the results of their labours should be lightly considered.

The vote was put and carried.

The **Chairman** announced that at the next technical meeting, on the 26th inst., the subject for discussion will be "Stripping Films." The next ordinary meeting will be held on May 10th.

London and Provincial Photographic Association.

This Society met as usual on Thursday, the 14th inst., when the chair was occupied by W. E. **Debenham**.

Several photographs—the work of members on the Easter Bank Holiday—were passed round and commented upon.

J. **Traill Taylor** drew attention to a letter, typical of several lately received by him, enquiring the cause of sundry spots appearing upon the surface after fixation of albumen prints. In the discussion thus provoked, one speaker stated that if the albumenized paper had been kept in stock a few months before sensitizing, spots of the kind complained of might be expected. Another fertile source was attributed to pieces of lime becoming attached to the surface of a print in certain toning baths. Metallic particles, communicated from the surrounding atmosphere, or by more direct means—such as the ash found about ordinary gas burners—contact with impure paper, &c., were said to be exceedingly destructive when lodged upon the surface of a damp print.

Speaking upon the subject of Society outings, Mr. **Taylor** said that the new railway pier at Gravesend offered unlimited opportunities for making marine photographic studies, and on Saturdays a return ticket could be had from London for a shilling *viâ* the L. C. and D. R. By employing a tolerably heavy camera, supported against his chest or shoulder instead of a tripod, he found no difficulty in "spotting" a passing vessel on a specific portion of the plate where it would make a good composition. He noted the position of the horizon line by scanning it from the top corner of the camera. Negatives made in this way would bear enlarging four or five diameters. A light camera was unsuited for such work.

"What lens best suits a detective camera, a single or a combination?" was a question read.

The **Chairman** replied that the Petzval type of moderately short focus answered very well, and others spoke in a similar strain.

Sensitized paper then formed the topic of conversation, and some of the better known methods of preserving it were mentioned, and experiences related in connection therewith.

Another question was read enquiring the leading indications noticeable when paper negatives have become fixed.

The **Chairman** pointed out that the texture of the paper used rendered it extremely difficult to know when complete fixation was really effected, and therefore the best way would be to leave paper negatives at least a third longer in the hypo solution than is requisite for visibly fixing a glass negative.

Photographers' Benevolent Association.

A special Committee meeting was held at 181, Aldersgate Street, on 18th inst., for the purpose of considering proposed alteration of rules.

Rule 4. After donors of one guinea and upwards shall be entitled to vote at general and special general meetings, also at the election of pensioners, add the words "and shall further have the privilege of recommending for the consideration of the Committee cases of non-members such as are defined as urgent in rule 13," viz., "Urgent cases are limited to such as arise from death, sudden illness, fire, or other unavoidable calamities; also, when the applicant has been out of employment for a length of time, and requires aid to take a situation."

Rule 10—Committee.—To read: "They shall have powers at their discretion to grant temporary assistance to applicants or cases recommended by donors under rule 4."

W. **Bedford**, in moving these amendments, said he thought that donors should have this privilege extended to them, many of whom, having cases of distress brought under their notice, would prefer the responsibility of dealing with them should be borne by an organised benevolent association, which would be in a better position to investigate the circumstances, and to insure the proper distribution of their contributions, and that by the alteration of rule empowering the Committee to act in such cases much good work would be done.

Mr. **Mackie**, in seconding the motion, said he believed the alteration would result in increased donations, and, therefore, greater facilities would be afforded for carrying out the objects of the Association.

After considerable discussion the meeting unanimously adopted the proposition.

The special general meeting to confirm these alterations was fixed for Thursday, May 5th, at 7·30 p.m.

At the ordinary committee meeting, Messrs. White, W. H. Dreaper, and G. S. Martin were elected members.

The **Secretary** read a letter from the London Stereoscopic Company, in which they stated their intention of holding their third annual exhibition in October next, which would benefit the Association, guaranteeing the benefit should not be less than 20 guineas, also making other proposals favourable to the Association.

Leicester and Leicestershire Photographic Society.

A meeting was held in the Mayor's Parlour, Old Town Hall, on the 13th inst., President **Geo. Bankart** in the chair.

The **President**, in a paper on "The Influence of Little Things in Photography," opened by saying that numerous failures might be traced to inattention to small matters, which he instanced by the fact that dust on the plates was a fruitful source of trouble, and recommended that the transparent spots produced by it on the plate should be spotted out with a suitable medium before varnishing. Referring to exposure, he said that any hard-and-fast rule could not be laid down. One maxim he impressed on his hearers was always to expose for the shadows, and let the lights take care of themselves. Development he considered secondary to exposure, as great range was permissable in this process; while in all he advocated cleanliness, dirty trays being a prolific source of trouble. Exactitude in weighing and measurement was strictly enjoined, and the rule-of-thumb in apportioning ammonia, pyro, and other chemicals was much to be deprecated. Retouching he considered quite legitimate and very useful, as by its aid breadth was secured without flatness. In the case of high lights being too decided and demonstrative, he recommended scraping the film with a sharp penknife and light touch to reduce them. He also advised, in landscape photography particularly, to avoid front light. He closed a clear and instructive address with a few useful hints as to printing, and other matters connected with the art.

A discussion on the several points alluded to in the paper then took place among the members, their various experiences in the matters introduced being very useful.

The meeting was then adjourned until May 11, when Mr. Tucker will give a paper on "Lantern Slides by Reduction," with practical illustrations.

Birmingham Photographic Society.

The usual fortnightly meeting was held in the Technical Schools, Bridge Street, Birmingham, on the 14th inst., W. J. **Harrison**, Vice-President, in the chair. G. Birkett and A. Townsend were elected members.

J. H. **Pickard** read the report of the excursion to Bridgnorth, from which it appeared that the number of pictures taken was 180, made up as follows:—Ilford plates, 89; Fry's, 9; Wratten's 2; Verel's, 10; Bernart's, 11; Eastman's film, 53; Morgan and Kidd's film, 6.

A number of exhibits were shown by Messrs. Leeson, Harrison, Karleese, Jaques, and Pickard, of Bridgnorth, Warwick, and other places taken during the Easter holidays. Mr. Harrison also exhibited some very good photographs on china plaques, made by Sampson and Bridgwood and Son, Longton.

E. H. Jaques then gave his paper on "Instantaneous Pictures and Appliances." In the course of his remarks he said:—"I find when showing or exhibiting photographs, that the greatest attention was called to instantaneous pictures; the great variety of subjects and naturalisation of effect lent a greater charm to the ordinary land or seascape, such as sea waves, clouds and ships, crowds of people, and other living objects, and lately have turned my attention to this class of work. I will now proceed to show you how I got the prize pictures, and the apparatus, &c., by which those and all my rapid negatives are done." The Lecturer commenced with the shutter, showing a large variety, beginning with the original drop-shutter down to the most modern ones of the present day, but said he preferred and always used the one made by Place; this, to his idea, gave very good exposure both for foreground and sky, and almost any speed can be got with it. Passing on, he came to the view-finder, or rather spot-finder, to enable one to see (say, for example) when on board one steamer to be sure of having another steamship on your plate, even while the vessels are both tossing on the waves. "Having gathered from our Mr. Foster's lecture a little time back some valuable hints as to composition and the strong (forte) points of a picture, I made a light wire frame and fastened across four black threads forming a corresponding design of these points. This I place on the front of the camera, and at the back over the focussing-glass I place a piece of flat brass, which, with hole in centre, forms the eye-piece. Now, having focussed for a certain distance, I insert the slide and open same; then, holding the camera by the hand (resting it on the legs to steady it) I look through the eye-piece at the frame with the crossed threads, and the moment the object required comes across the points wanted, loose the shutter with the pneumatic release, and the result is always correct." He next spoke of having had his best successes with Paget and Ilford rapid plates, and recommended slow development, and gave the developer he uses.

A—	Carbonate of potash	8 ounces
	Oxalate of potash	6 „
	Water	30 „
	Sulphuric acid	3 drops
B—	Sulphate of iron	4 ounces
	Water	10 „

Use 1 part of B to 4 parts of A. To accelerate or complete the development, use drops, as much as needful of

Bromide of ammonium	1 dram
Ammonia...	1 „
Hyposulphite soda	10 grains

He also recommended the Paget developer. The lecture was interspersed with numerous practical hints and illustrations, and was listened to with great attention and benefit.

A long discussion followed, in which Mr. Jaques gave great help, and the meeting ended by the Chairman announcing the subject of the next paper by F. Birkett, "Printing by Artificial Light."

Derby Photographic Society.

The usual monthly meeting was held on Tuesday evening, April 12th, Richard Keene in the chair,

It was decided to hold the first of the outdoor meetings for the summer months at Dale Abbey, on May 7th, R. Keene to conduct the party, and read a paper there on the history of the place.

The Hon. Sec. read a recommendation from the council to institute a competition at the out-door excursions, and it was decided that the best picture (to be declared by vote of members taken at these out-door meetings) be printed, and a copy presented to each number, and those receiving the second and third highest number of votes to be awarded a certificate, the whole to be exhibited at the annual *conversazione*.

Mr. Merry then gave a practical demonstration on "How to reduce in the camera, by solar light, from large negatives, for transparencies for the lantern."

Cardiff Amateur Photographic Society.

The monthly meeting was held on the 15th inst., S. W. Allen in the chair.

The election as members of Messrs. Evans, Powis, and Wills was confirmed.

D. Josti promised a lecture on the 27th inst. on "Retouching," concluding with remarks on Rembrandt's and Dore's pictures.

The Society's weekly excursions for May have been arranged as follows:—May 7th, Aber Valley; 14th, Treforist; 21st, Llandaff; 28th, Cardiff Castle (subject to permission).

Cheltenham Photographic Society.

The monthly meeting was held on April 14th, when a demonstration was given by C. Joyner of the use of the magnesium light in portraiture. The apparatus, of Mr. Joyner's own devising, consisted of a lantern constructed as follows. A wooden box, having at top and back glass reflectors, and in front a sloping pane of ground-glass, was suspended from the ceiling. On the floor of the box was a horizontal gas jet connected by rubber tubing with the gas supply. Just in front of the nipple was a small wire ring which held the lower end of the doubled magnesium ribbon, its upper end being attached to a hook vertically over the ring. The gas flame during the focussing was kept just alight, and when turned up, ignited the magnesium wire. To supplement the illumination, two other lengths of wire were burned in front of a tin reflector placed at the side and a little in front of the sitter. The duration of the light was about six seconds, and a very fairly exposed group of eight members was obtained with a rapid symmetrical lens, full aperture. An excellent single portrait was taken in one second with the lens stopped down. The demonstration showed clearly the great advantage that may be derived from this light, without any expensive apparatus or complicated details.

The question of the first excursion was settled in favour of Tintern in May.

The Secretary exhibited an actinometer sent by Green and Fuidge, and two others by Mr. Stanley.

Birkenhead Photographic Association.

The ordinary meeting was held on April 14, at the Free Public Library, J. A. Forrest, President, in the chair.

A. W. Taylor, Frank N. Eaton, and J. K. Smith, were elected members.

The President soon had the members thoroughly *en rapport* by the amusing narration of an adventure which befel an old gentleman a few days previously photographing some shipping on the Mersey. He had unwittingly fixed up his camera immediately in front of the electric cannon which supplies Liverpool with Greenwich time at one o'clock. While standing with his head under the cloth diligently focussing, bang! went the gun, the old gentleman and camera making an ignominious exit over the dock wall into the river, and being still more ignominiously fished out on the end of a boat hook, his first and last experience, he says, with the "wet process." Mr. Forrest also showed a frame of panoramic views embracing the twenty acres, on Bidston Hill, which it is hoped will be presented as a Jubilee offering by the Corporation to the public. The photographs were mounted in a long cut-out card, the thin division between each not materially interfering with their continuity as a whole.

Paul Lange exhibited some specimens of the new form of stripped films just brought out by Messrs Eastman. The negative being put on to a collodionised plate of glass, the paper is stripped away by the ordinary method, and to the film remaining is squeegeed one of the gelatine sheets prepared for the purpose. The whole, when dry and removed from the glass, forms an extremely thin and transparent negative. A number of prints were shown and received rather favourable criticism, as did the advantage in being able to attach the stripped films to a lighter medium than glass. Mr. Lange stated that he had found great care necessary in attaching the gelatine sheets, owing to their liability to cockle and warp.

The American air brush excited much interest on account of its novelty. It was ably demonstrated by G. E. Bell, the agent here for the American Company. By its aid in some five minutes he produced a life-sized drawing of a girl's head, which illustrated the beautiful gradations and depth of tone it is capable of rendering. A portfolio of finished drawings by him were very fine. To illustrate its usefulness in bromide and similar work Mr. Lange showed two platinotype enlargements of a head, the one finished with the air brush being immeasurably superior to the other. He said it had been found most useful in producing sky effects in paper negatives.

A number of specimens of phototype printing were passed round by the President; this process is a modification of the heliotype, the stone being used as in lithography, any colour being obtainable. The results showed great definition and sharpness, and closely resembled the finest steel engravings.

John Hargreaves gave the members the benefit of his researches in antiquarian lore by an amusing and descriptive account of places of historic and pictorial interest throughout Cheshire, with a view to the Association forming excursions to these spots during the summer, and so having a permanent record of their existence before they fall victims to the jerry builder.

Society of Amateur Photographers of New York.

A meeting was held on March 8, President Beach in the chair.

The President stated that a test lantern exhibition would be given Friday evening, March 18th, and the first spring lantern exhibition would occur on March 23rd, when one hundred and twenty-five slides contributed by the Boston Camera Club would be shown.

F. C. Beach: Before we commence the entertainment of the evening, Dr. Janeway has a few questions relative to the question box to dispose of.

Dr. Janeway: These questions are such that they require a categorical answer, and they therefore will not be discussed. The first question is evidently from a lady member, and is as follows: "Is there any process by which faded photographs can be restored? And if so, by what process?" The answer of the Committee is, Yes; there are one or two processes, but the one which I find most successful is a process described in the July number, 1884, of the *Photographic Times*, Scovill and Co., publishers. A copy of the photograph is first taken, for the reason that sometimes these faded photographs cannot be restored. From this negative a well-exposed positive is taken and developed pretty thoroughly, in order to get all the details and density possible. The photograph is placed in warm water, and after a while it separates from the mount. It is then laid in a flat dish just covered with warm water, and the starch on the back gently rubbed off. After the starch is entirely rubbed off it is rinsed in fresh water, and then put in a one-grain solution of bichloride of mercury. You will be astonished at how soon the bleaching process will take place. The yellow, almost a brown yellow, becomes quite white, and the dark portions of the picture will soon be a darker colour. It is then washed and put away to dry, and then mounted.

Question 1.—"Why does the colour of the precipitate of gold on a silver albumen print vary according to the toning bath; sodium acetate, sodium borate, sodium carbonate each giving a different tint?" To this question I will say, no one knows positively what the chemical action in the toning bath is. See page 107, "British Journal Almanac," 1886, "Theory of Toning."

Question 2.—"Why does the oxalate devel oper give a black colour, and the pyro developer a greenish-gray colour to the negative?" The plates of no two makers require the same amount of pyro. Therefore it is necessary to test them for the proper amount required by each to obtain uniformly good results. With proper management as perfect a black may be obtained with pyro as with iron.

Question 3.—"Where is to be found a record of the experiments going to prove the oft-stated opinion that the precipitate in a negative "is metallic silver?" See Dr. I. M. Eder's "Modern Dry Plates" edited by H. Baden Pritchard, page 30, &c.

Question 4.—"Where can one who believes that the success of a picture depends on the power to please the mind, find a course of instruction in art composition, either in a school or in a book?" Professor Spaulding says, "I should commend the little book written by H. P. Robinson, "Picture Making by Photography." Instruction could be obtained at the Art School of the Metropolitan Museum, 214, East 34th Street, John Ward Simpson, Superintendent. And I would say also, read "Pictorial Effect in Photography," H. P. Robinson; also "Wilson's Photographic Lessons A, K, L, and T." Lesson "A" is worth more than the cost of the whole book.

Question 5.—"Is there truth in the statement that silver chloride reproduces to a small degree the colours of the spectrum?" The statement is found on page 172 of "A History and Hand-book of Photography," by Tissandier, edited by Toompson." Yes. Consult Dr. Vogel's "Progress in Photography," page 78, &c.

George M. Hopkins showed some experiments on the refraction and reflection of light, and also, after the preliminary experiments some polariscope effects of light with the micro-polariscope were illustrated.

Talk in the Studio.

Photographic Society of Great Britain.—The next technical meeting will take place on Tuesday next, April 26th, at the Gallery, 5a, Pall Mall East, when the subject of "Stripping Films" (with demonstrations) will be brought forward.

Newcastle-on-Tyne and Northern Counties' Photographic Association.—The ordinary meeting was held in the College of Science, Newcastle, on the 12th inst., Professor Herschel in the chair; when Mr. Jackson, of the Eastman Dry Plate and Film Company, read a short paper and gave a demonstration of the Company's new stripping films. All the various operations were successfully carried through.

Death of J. B. Obernetter.—From J. R. Gotz we receive tidings of the untimely decease of this successful labourer in the field of photography. Mr. Gotz says:—"You will regret to hear of the sudden and unexpected death of J. B. Obernetter, the celebrated experimentalist of Munich, which took place on the 13th inst. He was only forty-seven years of age, and leaves a widow and six children."

Silver Prints, and Book Illustration.—*By W. Lang, jun.* At a recent meeting of the Glasgow Photographic Association, W. Lang, jun., read an interesting paper on photography and book illustration, and he enumerated a large number of books illustrated by silver prints, thus contributing an interesting item to the bibliography of photography. The following is an abstract of his paper. Talbot published the two books, "Sun Pictures in Scotland" and "The Pencil of Nature," and we may take it that the two works in question were the first in this or any other country sent forth to the world enriched with veritable photographs. In 1846 the "Art Union Journal" published, as a supplement, a specimen of Talbot's calotype. These prints were produced from various negatives. I have been informed that in an early number of the *Glasgow Merchants Magazine* there is to be found one of these Talbotypes also issued in supplement form, but this I have never seen. The first scientific Journal in this country to be illustrated was the *Quarterly Journal of Microscopical Science*. The print was published in 1853, and appeared in the April number of the Journal that year. There is an edition of Virgil's complete works, and our interest in it lies in the fact that the work has been profusely illustrated with small silver prints. These we find forming headpieces to the various books of the Æneid, &c. Judging from the appearance of the prints, I would be induced to say that they had been sulphur toned in the first instance. The pictures themselves are from studies of the antique. I understand that the publishers of this volume, Firmin-Didot, of Paris, also published an edition of Horace's works illustrated in the same way as the Virgil now before you. These volumes were, at their date of issue, somewhat high-priced. A work published by Collins, of Glasgow, and entitled "Palestine in 1860," contains silver prints, twenty-four in number, which were taken by a quondam member of this Association, John Cramb. The prints are all in excellent preservation, testifying to the original good character of the work produced. I have here a copy of a work embellished with Frith's handiwork, and it presents to us the leading characteristics of the fatherland of the Jews. The publication of this book, which has for its title "Sinai and Palestine," is also due to the enterprise of a Glasgow firm—viz., Wm. Mackenzie. The photographs were taken in the year 1857, thirty years ago. I presume that there is no one here unacquainted with "Rambles Round Glasgow," and "Days at the Coast." I was quite unaware, till recently, that editions of Macdonald's works had been published with photographs of the places referred to, and I regret I am as yet only able to show one of the works—viz., "Days at the Coast." The book was issued by Andrew Duthie, of Cordon Street. Throughout the book will be found twelve photographs, the work of Thomas Annan. There is no date of publication attached, but I am in a position to fix the date as about the year 1868. This work here, entitled the "Old College," being the Glasgow University album for 1869, next claims our attention. You will find therein two photographs, one of the old entrances to the College when it had its home in the High Street; the other giving a representation of the present edifice as it appeared in the year 1869, surrounded with scaffolding, and as you will see before that, the main central tower had begun to show itself. This print is, undoubtedly, a silver production; I am not so sure of the other one. I think it is a Woodburytype. In connection with this matter of the illustrating of books by means of the silver print, there is one firm in Glasgow that has done a good deal in this way—I refer to Messrs Annan—and through their kindness I am enabled to bring before you several volumes which as yet do not form part of my own collection. Messrs. Maclehose, several years ago (1870) published a work entitled "Old Country Houses of the Old Glasgow Gentry." Messrs. Annan have also reproduced in book form the works of Sir George Harvey and Sir Henry Raeburn. Many may remember a loan collection of pictures that was held in the Corporation Galleries in 1869. An interesting memento of the more prominent pictures then exhibited will be found in the volume lying on the table. It is the catalogue of the complete collection, interspersed throughout with silver prints. There is yet another book to which the Messrs. Annan have contributed the illustrations, entitled "A History of the County of Bute." The work is by John Eaton Reid. A son, I understand, of Senex Murray was the publisher, and we find throughout the work nine photographs of the principal places of interest on the island. The date of publication is 1864. Curiously enough, I have just been informed by Messrs. Annan that so recently as 1885 they prepared silver prints to illustrate a book published by Paterson of Edinburgh, "Castles and Mansions of Ayrshire." Very many other works have been illustrated by Annan, but as they have been done by carbon, we pass them over on this occasion. It is but fair to state, with reference to the illustrations in the last named work, that it was solely at the publishers' desire the silver prints were inserted. Messrs. Annan would have preferred either carbon or photogravure. "Wilson's Photographs of Scotch Scenery" are known to all of us. Could more appropriate illustrations be found for a work such as "Scott's Lady of the Lake?" This edition (published by Messrs A. and G. Black, of Edinburgh, in 1869) of Scott's famous poem contains eleven photographs by Wilson of the more picturesque spots. A work on Staffa and Iona, published by A. Marion, Jun., of London, in 1867, contains twelve photographs all emanating from the studio of George Wilson, Aberdeen. In another work, entitled "The Great Works of Raphael," and published by Bell and Dalby, London, in 1867, there will be found twenty silver prints. It is to be noted that the negatives in the first instance have been taken not from the original oil paintings by Raphael, but from what have been regarded as the best engravings of these masterpieces. In this other volume, also published by Bell and Dalby, the same course has been followed; the engravings of the artist's works have been photographed, and not the actual pictures themselves. There is another edition of the "Lady of the Lake," one published by A. W. Bennet, London, in 1863. The photographs illustrating the book are fourteen in number, and, with the exception of the frontispiece, by Wilson, of Aberdeen, are all by T. Ogle. Many of the views are very fine, having been taken from points of view not generally selected. Bennett seems to have been a publisher who believed in employing photography as a means of rendering his books attractive. This work, "A Walking Tour in Brittany," by J. M. Jephson, was sold along with a set of photographs (stereoscopic views), illustrative of places visited; and there is embodied in the work a series of photographic notes by Lovell Reeve, I presume the naturalist of that name. I have not these views, but there is as frontispiece a photographic representation of a street view of some town in Brittany; date of publication 1866. In an edition of William and Mary Howatt's "Ruined Abbeys and Castles of Great Britain," there are throughout the work a series of some twenty-seven photographs of a somewhat small size. The prints have had spaces left for them in the letterpress, and have been affixed, I presume, after the binding of the book had been completed. The photographs are all in very excellent preservation; they are by various contributors—Bedford, Sedgfield, Wilson, Fenton, and others. The publisher of this edition is also A. W. Bennett, London. A recently published volume, with silver prints for illustrations, is the one which I have here, and which hails from America; its title, "A Trip to Mexico," and the author, H. C. Becher. As the date of issue was 1880, we would scarcely expect to find symptoms of degradation already. It contains six photographs, and the publishers are Willing and Williamson, of Toronto.

Photographic Club.—The subject for discussion on April 27th will be "Lautern Matters." This is a lantern night. Visitors are invited.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

J. Trotter.—Your letter has been sent to the author, and if he thinks proper to supply the sketch, it will appear in the News for the benefit of all the readers.

R. G.—Quite possible, and indeed easy; but unless there are some special local features, it is convenient to turn towards the north, where a suitable lighting is obtained without trouble.

Perken, Son, and Rayment.—It is hardly a matter which affects our readers, nor is publicity in the News likely to reach all whom you would benefit by the notice. Possibly you may be able to find some literary magazine or general paper that is in the habit of inserting notices of this kind.

Appleton and Co.—We really can't tell you who makes them, but think any tinman of average intelligence would be able to construct them.

C. R. King.—In reprinting, it might be worth while to make the alteration you suggest.

M. H.—Thin sheet gelatine; but take care that all the materials are quite dry.

Arthur Wilkins.—It is a common result of over-exposure; and negatives can be reproduced (in a reversed direction) by this plan.

Focus.—1. You are quite right, and the same exposure should serve. 2. Yes, provided that you put on one side such disturbing influences as the quality of the glass and the degree of polish of the surface.

Sun Printing.—If you follow the subjoined directions, you will probably obtain the result you desire; if not, write again:—

No. 1.—	Ammonia citrate of iron... ...	2 ounces
	Distilled water	8 ,,
No. 2.—	Ferricyanide potassium	2 ,,
	Distilled water	8 ,,

Mix the two solutions, and keep in a darkened bottle. Take unglazed paper of a fine grain, and damp the sheets you propose to sensitize. With a sponge or rubber brush, float the solution over the paper as evenly as possible, and hang to dry in a darkened room. Do not prepare a larger quantity than you are going to shortly use, as the paper becomes slower by keeping. When printing, expose until the shadows assume a strong metallic grey colour, and detail begins to be lost. Wash well in cold water until, when held up by the corner, the drip from print shows no yellow tinge.

Wm. Ancock.—Dissolve 6 parts of gelatine in 50 of water by the aid of heat, and stir in one part of bichromate of potassium. Apply this hot, and in a week's time the gelatine will be quite insoluble, even if but little daylight enters the room.

Ernest Bilbrough.—1. The photograph is a very interesting one, and we are glad to have seen it. 2. Your request about sending it on has been attended to.

W. S. Fothergill.—1. Air-bubbles have prevented perfect contact with the ground glass. 2. Soak them in methylated spirit, blot off the excess, and then dry in a blotting book which has itself remained for some time in a warm place. For mounting we have used thin glue to which some spirit has been added; and the prints can be mounted before they are quite dry. 3. Much depends on the subject and size, and we think the glazed surface is to be preferred in the case of both the pictures you send.

Photographs Registered.

D. Hedors (Lytham)—Photo. of German Barque "Mexico," wrecked December 9, 1886.

R. C. Clifford (Bradford)—10 Photos. of Mr. and Mrs. Patrick O'Brien and others.

L. Weston & Son (Dover)—2 Photos. of W. H. Crundall, Esq.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

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HALATION AND FILM STAINING.

When treating recently of the evil results of halation, so often found as injuriously affecting negatives upon gelatine plates, we mentioned, amongst other available preventives, that of staining the film with colouring matter of vegetable origin, and said that we proposed shortly to take up again this branch of the subject. In fulfilment of that intention we proceed to describe one or two experiments that we have made in this direction. It will not, of course, be supposed that within the limits of a single article the subject of film staining can be treated in any way exhaustively, or that more can be done than to note some of the results obtained; which, however, show with sufficient distinctness that this method offers a remedy for, or rather preventive of, halation, and may serve as indications to those who may desire to pursue researches in the wide field that is open for investigation and experiment.

In the selection of a dye or stain for the purpose of preventing halation, there are several considerations that should be taken into account; but the one obviously to be looked to in the first instance, is that the stain should confer upon the film a sufficient power of resistance to the transmission of chemically active rays. In order to test the efficacy of various stains in this respect, an ordinary gelatine emulsion plate of commercial make was taken, and one half was immersed in, or covered with, a solution of the stain that was to be tested. The plate was drained and dried, and each half was then used as a light-filtering screen in front of a Warnerke sensitometer. As the question was one of offering resistance to rays of light as they exist in ordinary daylight, it was judged best to use daylight rather than the luminous tablet as the source of light; and as there were in each case only two exposures—that through the stained and that through the unstained half of the plate—to be compared with each other, the difficulty which would arise from the varying quality of daylight, if reference to any common standard were required, did not occur. The plate, one-half of which is stained, must of course be at least double the size of the sensitometer screen, and the same remark applies to the plate which is to receive the action of the light passing through the sensitometer and filtering screen. The ordinary half-plate suffices, and plates of this size were employed.

Upon thus trying the effect of film staining to stop the passage of actinic rays, it was found in some cases to be much less effective than the colour of the stained plate would lead one to suppose. In one case, for instance, where a tolerably full colour was visible, the actinic power of the light traversing the film was only reduced by about one-half. This was deemed to be insufficient to make it worth while to proceed with the experiment by preparing plates with dye of that strength and character. With two solutions about to be described, we found that whilst with an exposure with which no impression was registered upon a plate under a Warnerke screen covered with a film stained with these solutions, the No. 7 was distinctly visible when unstained portions of the same film were used as coverings for the screen. The difference indicated was sufficient to induce us to pursue the experiment by staining plates, and noting the effect of the stain upon their working qualities.

The two dye solutions referred to were saffron as representing a powerful yellow, and logwood as a red. Each was effective as a stain in stopping the transmission of light, and consequently as preventing halation; but they present somewhat different characteristic effects upon the working quality of the stained film.

Saffron is a bright yellow dye which is somewhat expensive, and consequently liable to adulteration; it is therefore necessary to obtain it from a trustworthy source. An infusion of this substance was made by pouring hot water upon it in the proportion of one ounce to each 40 grains of the stamens. When cold, the solution was filtered and taken to the coating room, where plates were immersed in it for three minutes, and then reared up to dry. The logwood solution was prepared in a similar manner, and with a like proportion of dyestuff, but as the solution became somewhat changed in appearance after the immersion of a plate, a fresh quantity was used for each, whereas with the saffron solution the same bulk was used with all the plates that were prepared.

Both saffron and logwood answered as preventives of halation. The subject selected for trial was one that with ordinary plates gives decided halation, namely the interior of a room, looking towards the window. Sash bars and curtains came out with beautiful distinctness, and no halation showed itself. Both dyes, however, slowed the plates, but each had a beneficial effect in another way. In a plate having a tendency to frill, logwood kept this tendency down; and in plates with an inclination to fog, both dyes had the effect of keeping the shadows clearer. This was remarkably evident with the saffron solution; the quality of the plate was wonderfully improved by the treatment, so much so that it suggests itself as being probably a useful method to adopt when line work, or anything requiring particularly clear shadows, is in question.

In order to ascertain whether orthochromatic power of any value was conferred upon the plates by the stains referred to, we photographed the colour sheet which was issued as a supplement with a recent number of the Photographic News. We could not detect any difference in the rendering of colour between the stained and the unstained plates, although the colour of the film was so very pronounced. The improvement of the image, however, when photographing subjects liable to give halation was so great, that we can recommend the process of staining as being one which far more than repays the trouble when images are in question that, with ordinary plates, would show halation, and where the slowing action of the dye upon the film is not important. The photographer who prepares his own plates may dispense with any extra operation by adding the dye (saffron) to the emulsion, instead of using a subsequent bath. With logwood and some other dyes the bath plan is the only practicable one.

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J. B. OBERNETTER.

Dr. W. H. Vogel is good enough to send us some interesting particulars concerning the illustrious experimenter, Obernetter, whom the world has just lost.

J. B. Obernetter died, at the age of 42, on the 13th of April, the immediate cause of death being heart-disease.

Obernetter was a man who helped himself; he relied on his own efforts, and he succeeded. He was son of the inspector of the Bavarian State Printing Office, and early in life he devoted himself to the study of chemistry, first in the way of private study, and afterwards at the University of Leipzig. Later on, he acted as assistant to the celebrated Pettenkoffer, and between 1859-1860 he walked in the laboratory of Prof. Kayser, and, by the advice of Liebig, devoted himself to the study of photography. At the close of 1860 he engaged himself in the establishment of Albert, where he busied himself in working out a new copying process, which was published in 1864. In 1865 he was actively engaged in photography, bring a member of the club, and doing excellent work in the way of burnt-in pictures by the dusting-on method. In Obernetter's hands everything succeeded well, as he had the energy and perseverance to push a thing to the end. He also worked out the dusting-on process for the reproduction of negatives, and this process served him well later on in connection with the collotype process. His collodion process on paper, although long neglected, has lately seen the light as a new thing under the names of Aristotype, &c.

Collotype was Obernetter's special field of work, and although he entered into this matter later than Albert, Husnik, and some others, yet he soon recognised the main thing needed—a satisfactory means of fixing the printing film to the glass. Albert's method consisted in the use of a substratum of chromated gelatine, the reverse side of which was exposed; but instead of this tedious operation, Obernetter adopted the now almost universally used water-glass substratum.

How, as regards the perfection of results, Obernetter surpassed his competitors is well known. In 1878 he published his reversed collodion process, and in 1882 he introduced his new emulsion process.

With hearty enthusiasm he worked at the colour-sensitive process published in May, 1884, and to him we largely owe the important position that this now holds.

For years have Goupils in Paris had a virtual monopoly of photographic printing from the copper plate, and then came Klic of Vienna, with this etching method; Obernetter, however, struck out a new path in connection with this work. He invented a method in which a gelatine negative—the silver image of which has been converted into chloride—serves as the etching medium; the chloride of silver being reduced to the metallic state. The wonderful results producible by this process have been repeatedly demonstrated.

Obernetter was a simple-minded man, who was friendly towards everyone; entirely without ostentation, and never striving after distinction. As long as photography lasts, the name of Obernetter will be remembered with honour.

NOTES ON THE ART GALLERIES.

The Royal Institute.

by wide angle.

The water colour exhibition of the Royal Institute is this year somewhat disappointing. There are few absolutely bad pictures, but the excellence belongs so much to the same standard, that the want of contrast gives an effect of monotony. The number, also, of the works exhibited, contributes to this feeling. To examine fairly over a thousand water-colour pictures is an impossibility. When a dozen pictures or so stand out from the rest the task of criticism becomes tolerably easy. But this is precisely what is not to be found in the exhibition. There is a dead level of merit, and the difficulty of selection consequently is enhanced.

Under these circumstances one naturally goes first to the well-known names, and of these Alfred Parsons may be placed at the head. His work is as conscientious as ever. Of his four contributions I prefer "Cowslip Balls" (No. 165), and "A Host of Golden Daffodils" (No. 365). They are both delightfully fresh. One does not need to be told that they represent spring weather. Mr. Parsons has very little mannerism; his work is clear and without affectation, and, therefore, well repays study. The President is represented by one picture only, which he calls "My tableau of 1885: the Emperor Maximillian visiting the studio of Albrecht Durer." The figures are presumably portraits. The picture is good, but does not excite one's enthusiasm. F. G. Cotman has some pleasant work, the most noticeable being "A Tranquil Evening" (No. 19), in which the mellow light and air of perfect repose have been admirably rendered.

Alfred East, in "A New Neighbourhood" (No. 70), has taken the most uninteresting subject possible, and whether he has succeeded in making it interesting or not, he must be complimented on his courage. The transition of a pleasant estate of field or wood into bricks and mortar is a most melancholy and prosaic sight, but Mr. East has managed to idealise the newly-made road, the half-finished houses, and even the scaffold-poles. However, he has only done this with the assistance of snow, a murky air, and a softening of repulsive features. In other words, the absolute truth of the picture must be doubted. If a photographer were asked why he did not photograph such a scene, he would simply look upon the questioner as a lunatic. Not by any dodge" could the camera be induced to give a poetic rendering of scaffold-poles.

The marine pictures of Edwin Hayes are always breezy and truthful, although, like most landscapes artists, he has a predilection for one aspect of nature. A grey stormy sky and troubled sea are what Mr. Hayes most delights in, and in "Wind off Shore Great Yarmouth" (No. 81), and "Vessel Entering Port Fowey" (No. 316), he is seen at his best. Charles Green's "Little Dorrit's Visit to her Sister at the Theatre" (625) is one of the few figure subjects of merit in the exhibition, but it can only be considered as an excuse for the posing of a group of pretty girls in the early Victorian dress. The incident itself was scarcely worth painting. James Orrock is one of the soundest and most industrious of landscape painters, and his "Dandie Dinmont's Hunting Ground" is a good sample of his style. Frank Dadd's manner has hardened considerably, and his "Ambition" (No. 650) looks more like a coloured print than a painting. There is humour in "The Inglorious Arts of Peace" (No. 469), and the old soldier sitting is excellently drawn, but the general effect is obtrusive in its colouring and pronounced outline.

C. E. Holloway's capital drawing of "Old Rye" (No. 112) suggests what a wealth of subjects there is for the camera in the quaint old town and its surroundings. It will repay the photographer to journey to this ancient Cinque Port. John O'Connor's "Down to the River"

(No. 156) forcibly sugests the scene painter. No one, I fancy, has ever been fortunate enough to see the water at London Bridge of the colour which Mr. O'Connor has given it. J. C. Dollman's "The Top of the Hill" (No. 161) is a simple subject treated with much pathos. A couple of horses have dragged a plough through a stiff soil to the top of a hill, and one, an old worn-out beast, has dropped dead with the effort. The look of sad surprise in the eyes of its companion is very suggestive.

T. C. Gotch, whose picture in the Dudley Gallery has been so deservedly praised, has an equally careful, if less ambitious work, in "News from the Beach" (194). All the figures have been conscientiously studied, and the face of the younger woman, telling of repressed emotion, is especially good. The "news" which the young fisherman has brought, it is to be feared, is bad. H. R. Steer's "Repose" (No. 210), the portrait of a young woman who has dropped off to sleep, apparently after a heavy dinner, cannot be commended. Probably the artist did not intend the result he has achieved. Arthur Severn has entered into competition with photography, in what may be called an instantaneous picture of "Brighton Beach" (No. 861). It cannot be said that the painter has gained a decided victory. Some of the figures savour somewhat of caricature.

Edith Heckstall Smith's "Across the Meadows," C. Napier Henry's "The Little Trawler" (No. 280), and "At the Harbour Buoy" (No. 919), C. J. Lewis's "A Thames Lock," are all meritorious pieces of work. H. Hine's seascape "In the Roaring Fortris" (No. 529) represents an unusual aspect of the sea. It may be true, but one has to make-believe very much.

A capital study of an old soldier's head is Walter Langley's "An Old Campaigner" (No. 729), and so also is "The Ship's Carpenter," by Joseph Knight (No. 539). It is not quite clear why Ayerst Ingram has made his "Unemployed" (No. 935)—two tramps, a man and woman—stand apparently in a road which inclines at an angle of quite forty-five degrees. The effect is, to say the least, very singular. Walter Langley's "Betrayed" (No. 974) is well painted, but not quite natural. A woman about to leave her native village under the circumstances suggested by Mr. Langley would not choose the broad light of day, or, if she did, would select some time when all the gossips were not in the street.

One of the cleverest pictures in the Exhibition is G. C. Kilburne's "The Rigour of the Game" (No. 939). The faces of the two old ladies and that of the old gentleman in profile are capitally drawn. They are impatient for the fourth player, a pretty girl, to lay down her card, and are keenly watching the handsome young man looking over the girl's shoulder, lest he should give her a hint. It is not always easy to say which is the worst picture in a gallery, but so far as this exhibition is concerned, I think No. 848, by John Absolon, is fully entitled to the honour.

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BUSINESS MANAGEMENT.

BY CRITICUS.

No. VI.

In continuance of the subject partially dealt with in our last, we have now to add that in devising any plan for the construction of entirely new premises, or the alteration and reconstruction of existing buildings in order to render them better suited to the purposes of photography, provision should be made in the aforesaid plan to secure several rooms in the establishment, wherein the various manipulations connected with and indispensable to the production of fair average work may be separately performed. In an ordinary photographic business, the principal feature of which is portraiture, the work cannot be so thoroughly done with restricted and inconvenient appointments as it can when the exact contrary is the case. For instance, a suitable apartment is requisite for the developing process, and though mis-named a dark room, success or failure depends very much upon the character and quantity of the light admitted to illuminate it. Again, special arrangements become necessary for the work of copying, for which a demand may generally be anticipated; printing, toning, fixing, washing, drying, mounting, finishing, retouching, &c., each form distinct processes, and are more conveniently carried out in a sphere of their own. A dry room or suite of rooms for the storing of negatives, another for apparatus and stock, will also be necessary, and it is decidedly preferable that the arrangements of studio and show-room should not be interfered with for any other purposes, except, perhaps, office work and the despatch of orders which may under some conditions take place in a show-room. Businesses of magnitude necessitate special provisions, according to their nature and extent, and in determining them advantage will be derived by subdividing the departments above enumerated, and adding others which appear requisite; but when businesses not of an especial nature are doing less than a thousand a year, the accommodation referred to above will be found to be ample.

The precise situation of work-rooms in relation to each other is not altogether unimportant, though it will, in many cases, be governed by circumstances. Custom has not so far established any fixed and unalterable rule in this respect, but we think the time has arrived when some general lines should be followed. The favourite location of the developing room is in close proximity to the studio, where it has been found the most convenient position. It should be both commodious and well-ventilated, in order that those whose duties compel them to spend several hours per diem within its walls may not suffer inconvenience, and the evil consequences set up by inhaling the constituents of a confined pernicious atmosphere. The illumination provided should, as a matter of convenience, comprise arrangements for both day and artificial light, but whether it be a mixture of yellow and green, assiduously advocated by W. E. Debenham; pure yellow, such as may be obtained by the use of a few layers of "golden fabric;" any red coloured mediums or their combinations of a trustworthy nature, which may be chosen, it is always better that the light should be in abundance, for if error has been committed in this respect there is little difficulty in correcting it. A good supply of water, and the means of conducting away the waste, is also an essential feature in dealing with the problem of the best position to have the developing room; in fact, this water question is about the only difficulty in the way of its being always attached to the studio. When building space permits the construction of the studio similarly to that mentioned in our last, the most convenient place for a laboratory and dark-room is at the end of the erection, made by adding a dozen feet or so to its length. Here many facilities will be afforded for rapidity of working; among them we may refer to the possibility of converting one side of such a room into a tolerably perfect enlarging camera by the mere addition, in the way of plant, of such articles as a vertical easel, travelling along a tramway, or in guides of rigid construction, and adjustable clamping plates fitted to the easel for the purpose of plate-holders sliding thereon; the same arrangement also answering all the requirements for making enlargements on bromide paper, transparencies, and some other purposes ordinarily carried out upon the principle of lantern and camera projection. Copying prints and other surfaces may also be done by this means when found more convenient. There is not much difficulty attending the plan of using the room as a copying camera, and the advantages derived therefrom fully compensate for the trouble. Not the least of the considerations is the reduction in expense, as regards much otherwise costly and sometimes cumbrous apparatus; again, it possesses the merit of being always ready for use, with no further trouble, possibly, than that of sliding back a shutter or non-actinic window. Of course some precaution is necessary that stray light of an effective character does not penetrate to surfaces where it is not wanted. Fortunately this can be easily provided against by admitting actinic rays only through the negative under treatment, and projecting these rays that pass through the lens to form an image directly upon the focussing screen or sensitive surface, as the case may be. By the use of lenses possessing a moderate angle, and perhaps a curtain for the purpose of intercepting reflected light, the work of enlarging can be carried on simultaneously with that of developing and that of changing plates. In busy studios, it is a great boon to have plates ready to hand, so that at any moment another exposure can be made on any subject, in addition to those decided upon, should circumstances render such a proceeding expedient. When the developing room is close by, a constant supply of sensitive plates can readily be passed out through a suitably protected trap, the form of which may be that of a sliding or fixed mahogany case, panel, or other design, with a door on each side, so that when plates have been exposed, and are returned to the cupboard, they can be taken by an assistant from inside, and at once developed, unexposed plates being returned in their place.

So few photographers now employ pyrogallol in the dry state to mix a developer immediately before use, that it is scarcely requisite here to point out evil effects produced when this substance floats in the atmosphere, either through incautious handling or becoming loose about the floor, and afterwards kicked up in the form of dust. Hypo and other saline solutions spilt about the floor are also liable to become disseminated in the same way when their presence would prove injurious. Indeed it is only when precaution has been taken against the occurrence of these possible sources of failure that one's dark room may be convertible into a mammoth camera of a reliable character.

The plan of two dark rooms, one within another, is a good one, but not always attainable; it possesses the advantage of economising space, and keeps the interior of the two more select for the special work of developing, while the outer room can be utilized for the purposes of copying. Varnishing, spotting, and retouching negatives do not necessitate any special description of apartment, since any ordinary room not facing southward answers well enough for the two latter purposes, and an apartment devoid of draughts is suited for the former work.

The printing room is one of considerable importance, and experence has taught the wisdom of expending some pains upon its construction, both internally as well as externally. In a large business many rooms are devoted to this branch, and expressly fitted for the work of sensitizing albumenized paper, drying and cutting up the sensitized silver chloride paper, filling and re-filling the printing frames, toning, fixing, &c., separate apartments are also assigned to the purposes of carbon printing and other processes. With regard to the former method—that of silver printing—it is a well known circumstance that an equable temperature of 65° F. throughout the year is by far the best in which to carry on sensitizing, toning, and fixing, and that extremes of temperature are detrimental. Partly for this reason, and from the fact that a plentiful supply of water, and the means of carrying the same away, is absolutely necessary, the choice of position for the printing departments usually situates them on or near the ground floor, with easy access to an unobstructed north light. Perhaps no means of introducing artificial heat into the printing room or rooms is so satisfactory as that of a complete system of hot water pipes, which not only keeps the temperature regular during the winter months, but supplies the printers, both silver and carbon, with an abundance of warm water, which they need for effectively doing their work. One of the best fitted establishments which we have had the pleasure of inspecting was that of G. W. Wilson, the celebrated Aberdeen landscapist and photographic publisher. The whole premises, covering nearly a quarter of an acre, were at that time heated by water pipes which circulated through every room and part of the buildings. The toning room accommodated a large number of hands, each of whom was supplied with separate washing and toning arrangements, comprising a plentiful supply of both hot and cold water.

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INSTANTANEOUS STUDIES.

No. 10.—The Model Photographer.

Model Photographer. My plan is—please the sitter. That's the secret of success and a good business. Ah! here comes a sitter. Watch what I do.

Lady. I wish to have my portrait taken, if you please!

P. With pleasure, madam. (*To assistant, in audible whisper.*) What an expressive face? (*To lady*) Will you kindly take a seat? I shall be disengaged almost directly. Miss Smith, will you attend to this lady? (*Exit.*

Miss Smith (*the young lady who attends to the reception room*). What can I offer you, madam? A glass of champagne? Or would you prefer an ice or some chocolate creams? There is no extra charge. Would you like to look at the fashion books? We have the very latest.

(*Lady refreshes herself, and is at length summoned to the studio.*)

L. I am afraid you will have some trouble with me. I always make such a wretched portrait.

M. P. (*in affected surprise.*) Is it possible? Now I should have thought there would not have been the slightest difficulty. It is simply a question of expression.

L. (*much gratified.*) Well, my friends always tell me that my expression is rarely conveyed. I don't know why it is, but in my photographs I always appear with deep lines at the corners of my mouth, lines under the eyes, and positive wrinkles in the forehead.

M. P. (*apparently thunderstruck*) I cannot understand that at all. There is really no reason why. Now, if you please, will you sit down? Ah! that is a charming view of your face. Perhaps just a thought more to the left to get the fine curve of the chin. Very good indeed. By the way, how admirably your dress is adapted for photography.

L. I am glad you like it. Some of my friends thought it was too light, and some said it was too dark.

M. P. Not at all. It is just right. If the head is thrown slightly towards the right shoulder we shall get a little more vivacity and animation. Yes, that will do.

L. Pray don't take me with a simper. Some of my friends have been taken what is called smiling, and I think they look hideous.

M. P. (*soothingly*). Quite so. Yet we mustn't have you looking too severe. That would not represent you truthfully. I have, from observation, acquired some knowledge in physiognomy, and I should think you were exceedingly amiable.

Lady (*much flattered*). Oh, not always.

M. P. Ha-ha! Well, we must try and not make you look in one of your exceptional moods. Now, if you please, direct your gaze in that mirror.

Lady. What, in that looking-glass?

M. P. Certainly. Can you see yourself without effort? Very good. Thank you.

(*Exit into dark-room, and re-appears after the usual fashion.*)

Lady. Well, is it a failure?

M. P. (*emphatically*). Certainly not. One of the finest portraits I ever saw in my life. Perfect.

Lady. Can I see it?

M. P. No, it would not be of any use. You could see nothing on the plate. I am sure you will be delighted. You shall have a proof in a very few days. (*Exit Lady.*)

M. P. (*to Assistant*). Be very particular how you work on this negative. Recollect the lines at the corners of the mouth must be taken out, the lines under the eyes obliterated, and the wrinkles in the forehead softened. I should light up the eye a little more—you noticed, perhaps, the lady's eye was rather fish-like—and redraw the chin. The eyebrows, too, might be made slightly stronger.

(*And this is how the Model Photographer pleases the sitter.*)

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTE.

BY CHAPMAN JONES.

Chapter VI.—Hydrochloric Acid—Nitric Acid—Aqua Regia—Potassium, Sodium, and Ammonium Compounds—Alum—Iron Salts—Silver Salts—Gelatine.

Hydrochloric acid (HCl) is prepared by warming together common salt and strong sulphuric acid.

$$2NaCl + H_2SO_4 = Na_2SO_4 + 2HCl$$

The hydrochloric acid escapes as a colourless gas, and is conducted into water to form the solution that is sold as "spirits of salts," "muriatic acid," or "hydrochloric acid." This solution contains generally about 33 per cent. of real acid, and never more than 40 per cent. It is made weaker by heating, it rapidly volatilizes at the temperature of boiling water, and has no charring effect upon wood or paper; it is therefore a safer acid to use than sulphuric for removing or preventing stains on gelatine films, &c. Dilute hydrochloric acid acts in the same way as dilute sulphuric acid in the majority of cases.

Nitric acid (also called "aqua fortis," HNO_3) is prepared by the action of stong sulphuric acid upon potassium or sodium nitrate, and is a liquid. The strongest commercially obtainable has a specific gravity of about 1·5, but what is undertood as strong nitric acid has a considerably less specific gravity, and contains at least some thirty per cent. of water. Nitric acid is very easily decomposed, giving up a part of its oxygen, the deoxidized residue of the acid showing as reddish fumes; it is therefore generally inferior to hydrochloric acid except for purpose of oxidation, and where soluble silver salts are concerned (hydrochloric acid would form the insoluble chloride of silver). When mixed with about four times its volume of hydrochloric acid, aqua regia is formed, which has the power of dissolving gold and platinum. The active agent of aqua regia is the chlorine liberated from the hydrochloric acid by the oxygen of the nitric acid.

$$O + 2HCl = H_2O + Cl_2$$

Nitric acid acts upon most of the common metals, their oxides, hydrates or carbonates, including silver, producing nitrates; and its action upon the various forms of cellulose is perfetly analogous.

In reviewing the chemistry of the metals from a photographic point of view as concisely as possible, it will be convenient to consider the two alkali metals, potassium and sodium, and the compounds of ammonium, simultaneously. Although potassium and sodium in the isolated form, as metals, have no practical interest to the photographer, one point about them is worth noticing, because it gives the key to differences in the effects of their compounds. Both metals decompose water when thrown upon it, and liberate hydrogen; but potassium acts with so much more energy than sodium that the liberated gas is ignited. On referring to the tables of atomic weights and valency, it will be seen that thirty-nine parts by weight of potassium are required to do the same amount of work in forming compounds, or to occupy the same place as twenty-three parts by weight of sodium. Weight for weight, therefore, the former metal has less power than the latter, but it exerts its power with more intensity. The same difference may be traced through the compounds of these metals.

Potassium and sodium compounds are not volatile up to a red heat. Some are decomposed by heating, but the metals always remain in the residue. Ammonium compounds, on the other hand, are always either volatilised or decomposed by heating them; the ammonia is always driven off. Hence ammonia used to be called the "volatile alkali."

The hydrates of potassium (KOH), sodium (NaOH), and ammonium (AmOH), are commonly called caustic potash, caustic soda, and ammonia, respectively; and their caustic nature is shown by the rapidity with which they will disintegrate one's skin. The carbonates used to be called the "mild" alkalies to distinguish them from the caustic alkalies, and the old name very well describes the difference between them. Caustic potash and soda cannot be purchased pure because there is no ready means of separating foreign matter from them, and they absorb acids of any description with great avidity. They dissolve grease, and hence are useful as detergents, but as they have a very decided action upon glass, they should be avoided or used sparingly for cleaning plates. Ammonia mixed with alcohol would appear to be preferable if we merely regard the preservation of the surface of the glass.

The carbonates of potassium and sodium are easily obtained pure, and are both crystallizable. The crystals contain water in very different proportions, but the dry salts can be purchased. "Washing soda" is crystallised sodium carbonate ($Na_2CO_3, 10H_2O$); it contains more than half its weight of water, and by exposure to the air loses some of its water and becomes opaque. It should be noted that carbonate of sodium is commonly called "soda," and that what is generally sold by retail druggists as "carbonate of soda" (for medicinal purposes, putting in the teapot, &c.) is the bicarbonate, and useless as a substitute for the other. Carbonate of potassium when crystallised contains about one-fifth its weight of water (K_2CO_3, $2H_2O$), and by exposure to the air absorbs water, eventually getting pasty and wet. Carbonate of ammonia is prepared in hard, irregular lumps which smell strongly of ammonia and lose ammonia on keeping, leaving an opaque powder of bicarbonate.

Bromide of potassium (KBr) is less liable to change than bromide of ammonium (AmBr). and is to be preferred on this account. Weight for weight, however, the potassium salt does not appear to be so powerful a restrainer as the other. Molecular proportions of each have, perhaps, equal restraining power, in which case five grains of ammonium, bromide would be equivalent to six grains of potassium bromide.

Iodide of potassium (KI) should be quite white and dry, otherwise it is safer to reject it. By exposure to the air it is decomposed with liberation of iodine which colours it brown, and carbonate of potassium is formed, which absorbs moisture and makes the salt wet.

Sodium sulphite (Na_2SO_3) is best prepared from sodium carbonate and sulphurous anhydride. It is convenient to take dry sodium carbonate and dissolve it in five times its weight of water, and to pass a current of sulphurous anhydride into the boiling solution until a drop withdrawn from the solution shows a strong acid reaction. The solution contains about 25 per cent. of the salt, and should be stored in little bottles filled to the neck, and corked with sound corks, which are subsequently waxed. The solution will probably be strongly acid, and it will be necessary to find how much ammonia is neutralised by a dram of it, so that the required additional amount may be added to the developer. If for use with the potash or soda developer, it will be convenient to drop a strong solution of caustic soda into about nine-tenths of the total solution until it is alkaline, and then to add the remainder, taking care that the final mixture is acid. It would be useless for the photographer who is not accustomed to chemical operations to attempt to prepare his own sulphite; he must buy the solid salt, take care that the lumps are perfectly clean looking, and show no signs of changing to a white powder. Samples may be compared by the method already given for sulphurous acid. The solution of the solid should be made just acid with citric acid, not sulphuric acid. Sodium sulphite deteriorates when exposed to the air by absorbing oxygen and forming sulphate. The sulphate of soda is worse than useless in the developer, but does no harm when the partially oxidised sulphite is used as a follower to mercuric chloride in intensification.

Sodium hyposulphite ($Na_2S_2O_3, 5H_2O$), also called sodium thiosulphate, is more stable than the sulphite. It is safe to always make the solution of it slightly alkaline with ammonia or carbonate of soda, though it does not appear to be necessary to do so. A solution of it should not be used until a day or so after it is made up, to allow a little sulphur that is generally liberated to deposit itself. Sodium hyposulphite, if clean, may be relied upon. It is decomposed by acids and by alum with production of sulphurous anhydride and precipitation of sulphur, thus

$$Na_2S_2O_3 + 2HCl = 2NaCl + SO_2 + S + H_2O$$

and by ferric chloride or peroxide of hydrogen it is oxidised to sulphate. Its action upon silver salts will be considered subsequently.

Alum is a double sulphate of aluminium and ammonium.

$$(AmAl(SO_4)_2,12H_2O).$$

It is soluble in about eighteen parts of cold water, it has a strong acid reaction to litmus, and indeed acts generally like an acid, except that it hardens gelatine.

Ferrous sulphate (also called green-vitriol or copperas, $FESO_4,7H_2O$) forms green crystals which, when fairly pure and clean, are remarkably permanent. Ten to fifteen years' preservation in a corked bottle will not appreciably affect them. This salt should be dissolved in cold water, twice its weight of water is sufficient, as heating with water causes a partial decomposition unless an acid is previously added. The solution is oxidized and so rendered useless by exposure to the air, with the formation of a rusty coloured precipitate. If an acid or an alkaline citrate has been added, the oxidation will take place, but no precipitate will fall.

If a solution of ferrous sulphate is mixed with a solution of oxalic acid and warmed, a copious yellow precipitate of ferrous oxalate (FeC_2O_4) forms. This compound is practically insoluble in water, and soluble in alkaline oxalates. Potassium oxalate is preferred as a solvent, because a saturated solution of it dissolves more of the ferrous salt than either of the other oxalates.

Silver is a white metal. It is an interesting coincidence that this metal, which is the best known conductor of heat and electricity, forms compounds which are the most usefully acted upon by light. Many metallic compounds are decomposed by exposure to light, but it appears that silver alone gives compounds that are affected by an exceedingly small amount of light in such a way that a reducing agent (or developer) is enabled thereby to cause a complete decomposition of the salt used.

The action of light upon silver compounds and other metallic salts, and the chemistry of the changes involved in photographic operations in general, will be considered in connection with the operations themselves.

If a bone is soaked in dilute hydrochloric acid for a few days, the mineral matter, which is chiefly phosphate of lime, will be dissolved away. The bone will not have suffered much visible change, but instead of being hard it will be tough and soft while still wet. The substance that remains is the organic part of the bone, and is called "ossein." When ossein is boiled in water it does not suffer an appreciable change in composition, but it gradually becomes soluble, and the solution obtained sets to a jelly as it cools. This product is gelatine. Skin and hide also give gelatine when boiled with water, but unossified cartilage yields a jelly which has different properties and is called "chondrin." Chondrin is present to a considerable extent in "size;" it is less adhesive than gelatine, and also differs from it in being made insoluble by nearly all acids, by alum, and by iron salts, but not by corrosive sublimate. It is present in varying quantities in commercial gelatine, and to the least extent in those specially prepared for photographic purposes.

Isinglass is a variety of gelatine prepared principally from the swimming-bladder of the sturgeon. Glue is an impure gelatine made from animal offal. The purer sorts of gelatine are prepared from selected materials, after they have been subjected to a prolonged cleaning process by means of alkali and sulphurous acid, by extracting them with steam, allowing undissolved matter to settle out of the solution, cooling to gelatinize, and thoroughly washing the jelly to remove the acid. It is then re-melted, and worked into the desired form for drying.

Gelatine varies even from similar tissues of animals of different ages, and it also varies according to the treatment the raw material has undergone in its preparation. So far as its chemical composition goes it is only necessary to note that it is nitrogenous and contains from ·1 to ·7 per cent. of sulphur. It should be colourless, transparent, hard when dry, inodorous, and when in solution, tasteless and neither acid nor alkaline. It sinks in water. When heated it melts and decomposes, giving off ammoniacal fumes, like most nitrogenous substances of animal origin, and when burnt away should not leave more than 1 to 2 per cent. of ash. If placed in cold water, it swells very considerably, and absorbs from five to ten times its weight of water without appreciably dissolving. The swelled gelatine dissolves in hot water, and if the water used is not more than one hundred times the weight of the gelatine, the solution will gelatinize on cooling; but with 150 parts of water to one of gelatine, the solution will remain liquid. By prolonged heating of the water solution, as in cooking emulsions, it gradually loses its gelatinizing qualities, and the change takes place more quickly at a high than at a low temperature; but alcohol will precipitate from such a solution gelatine that will gelatinize when boiled with fresh water.

Strong sulphuric or nitric acid changes gelatine into entirely different substances which are readily soluble; hydrochloric acid that is not too weak dissolves gelatine; acetic acid causes it to swell up, makes it soft and transparent, and finally dissolves it. The acetic acid solution, though it does not gelatinize, retains the adhesive qualities of the gelatine, and is the foundation of "liquid glue." Slightly diluted nitric acid acts in a somewhat similar way to acetic acid. Dilute acids in general neither prevent the gelatinization of gelatine, nor make it insoluble; nor do dilute alkalies, or even strong ammonia.

Moist gelatine exposed to the air decomposes, becoming first acid, and then alkaline from the production of ammonia. The development of an acid reaction is characteristic of gelatine, and acidity in a sample may indicate that putrefaction has begun, or, on the other hand, that the acid used in the preparation of the article has not been thoroughly washed out. At a temperature of 90° Fah. the decomposition of moist gelatine may begin in twenty-four hours, but gelatine appears to remain unchanged almost indefinitely if carefully kept dry.

Soluble gold and silver salts do not make gelatine insoluble, and such mixtures are readily acted upon by light. Nitrate of silver with gelatine is reduced on exposure, with formation of red-coloured products. Tannic acid ("tannin") gives a very insoluble compound with gelatine, but if applied to a gelatine negative causes rapid frilling and blistering, unless the solution used is very weak indeed.

Corrosive sublimate, platinic chloride, chrome alum and chlorine gas make gelatine insoluble, and alcohol also precipitates it from aqueous solutions. Bromine and iodine combine with gelatine without rendering it insoluble. Ordinary alum raises the temperature at which it dissolves. Alum, alcohol, carbolic acid, salicylic acid, chloral, thymol, or zinc salts, in small quantities, or glycerin in considerable quantities, retard or prevent the putrefaction of gelatine.

PHOTOGRAPHIC REPRODUCTION OF COLOURED OBJECTS WITH COLLODION.

BY C. STUREMBURG.*

Third and Concluding Paper.

The proper illumination of coloured objects for the purpose of being photographed demands our consideration and attention, for upon it depends in a great measure success or failure. Oil paintings, aquarells, and other objects can only be reproduced in correct colour value when properly lighted. With landscapes, of course, the natural light allows of no alteration.

The best light for reproductions is diffused day-light, coming from a northerly direction, as generally used in portrait ateliers, although in many cases preference may be given to direct sunlight. Very dark oil paintings, reflecting light in parts, or minor details, may allow the use of direct sunlight, but in all other respects it had better be excluded, as with its increased energy shadows in brighter parts of the original, or clouds and atmospheric effects in landscapes, are invariably lost.

Diffused light acts quite differently. With a long-continued exposure, the darker colours will impress the sensitive plate, and the bright portions of the original will not be over-exposed at a sacrifice of details, nor will it disturb the harmony of the tones in the reproduced pictures. A correct illumination of the subject contributes much to a good result; upon it depends a true reproduction of colour values, to such an extent as to exclude the employment of particular processes altogether.

Of equal importance with the correctly lighted subject is the quality and capacity of the objective to be used. It may appear to be audacious to say that upon the objective depends the reproduction of colour tones, or that it influences in any way the results, but it is so in reality, not approximately only, but to a much greater extent than may be supposed.

With the exception of instantaneous exposures, all objectives of strong luminous power, and a short focal length, like the ordinary portrait lens, should be avoided. For reproductions and landscapes, long focus, single achromatic lenses are decidedly to to be preferred. There is a very marked difference in pictures taken with either a long or a short focal lens, and equally so will be found to be the chemical or strict photographic effects. With instruments of strong luminous power, light is highly concentrated, and the bright parts of the picture are rendered extremely light; the shadows, proportionally, too dark. The contrasts are enormous, and an exaggerated brightness prevails in the centre of the field of vision, gradually diminishing towards the margin, where neither light nor shadow are represented in proper proportion. A single achromatic lens makes pictures without showing such strong contrasts, light and shade are in proportion, and the effects are much softer. Greater length of focus, and, combined with it, limited deflection of rays, distributes light more uniformly over the whole extent of the field, and causes a more truthful reproduction of colour values..

So much for the modification of valuable, old-established processes, and their utility in reproductive photography. It will be seen how, with them, even colour values may be rendered correctly upon the copy. The effects of single colours may not be as distinctly marked upon the photographic plate as with the isochromatic method, but in the general results of a reproduced picture no disadvantageous effects are noticed.

If an equalization of colour tones is carried on to excess, it may easily occur that two colours in juxta-position, totally different in the original, should show quite equal effects upon the isochromatic copy, blending into each other so far as to destroy entirely the distinguishing contours. It has even occurred that certain colours appear much brighter in the photograph than in the original, when comparing them with others in their vicinity.

When using the modified collodion process for practical work, extreme caution should be observed in the preparation and purity of chemicals, as well as a strict adherence to the formula given. Only then brilliant and satisfactory negatives can be obtained. Result is the main point of all our efforts. Neither the engraver nor the lithographer is capable of reproducing colours direct upon a plate, and, like the photographer, he must resort to only one and the same colour in producing gradations and modulations. Photographers have always insisted upon being called artists. Very well. A field has now opened before them to show whether they are or not. Artists are very frequently able to make the most beautiful pictures by the aid of very simple means; so should the photographer by the intellectual application of the simple, but valuable and well-tried collodion process, be able to show, even in exceptional or particular cases, artistic abilities.

The wet collodion plate, capable of modification in a thousand ways, and applicable in endless directions, cannot, at least at present, be supplanted by methods which have not been as yet fully developed, and which are still in an experimental state. It may be possible that, in course of time, these processes will be brought to such perfection as to give better results, with less difficulties, than those to which we are used. Then, and only then, the wet collodion plate will be entirely superseded.—*Photographic Times.*

DETECTIVE CAMERAS.

BY W. JOHNSON.*

The detective camera is gaining in popularity so fast, that at no distant day the outfit of the amateur and professional alike will not be considered complete without it, and happy is he who is now its possessor. Every shot he makes with it, providing it be a success, will be a revelation to him. The time is fast approaching when we shall have to look to it for those choice little bits of nature's painting, those little "genre" subjects which we now secure by dint of coaxing and an infinite amount of patience, not to say the least, the waste of the plates. Even now the street Arab and the country folk can recognize the camera and tripod, disguise it as you may, and the amateur is often met with derisive laughs and bits of pleasantry, such as the following: "Say, mister, will I break the glass if I look at it?" or "Be you an engineer?"

The detective camera does not differ materially from the portrait camera of to-day. It has a lens, shutter, bellows, plate holder and focussing attachment, and sometimes, when intended for both time and instantaneous work, a focussing screen, the only difference to speak of being an attachment to approximately determine the focus, so that the operator need not look at the focussing screen. In their construction there are several essential features to be borne in mind, viz., compactness, weight (with due consideration to strength), simplicity and ease of operation, and moderate cost. Compactness and weight are, of course, dependent on the number and size of plates used, and must be left to the taste of the operator. Simplicity and ease of operation are very essential, as experience will show; as many times we may wish to repeat an exposure, and before we can change the exposed for a fresh plate the opportunity is gone.

The moderate cost is dependent upon the taste of the buyer, as the lenses form no inconsiderable proportion of the cost of the apparatus. I have seen very creditable work done by a lens of French make costing from one-half to two-thirds less than one of English manufacture. While being a little partial to the latter, I could not have told which lens had been used in its production. American and English lenses are perhaps more uniform in quality than those of French make.

The German lenses also have a reputation second only to those of England. Long focus lenses are preferable to those of short focus, as they do not, like the latter, distort the perspective, and render more truthfully the view as seen by the naked eye.

As to the size of plate, I find the 4 by 5 the best, as it can be used to advantage in the making of lantern slides by contact. The only objection to a larger size plate is its making the camera so bulky as to become unmanageable. It ought not to be larger than can be held comfortably under the right arm, the box resting on the right hip, its longer proportion from front to back, as this brings the finder more to the front. The release for the shutter should be worked by the middle or index finger of the right hand, as that hand (with the exception of one who is left-handed) is more subservient to the eye than is the left. The focussing might be done with the left hand, it being slower and better adapted to this purpose. The focussing should be done, if possible, by means of a lever underneath the box and out of sight.

As to the best form of shutter, opinions are at variance, some preferring the drop, or a modification of it, others the come and go, while a greater proportion use the circular form for its ease of construction, it being freer from vibration than the other. I prefer the latter, as I can detect no difference in work done by this from the other way.

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* Continued from p. 236

* [Read before the Photographic Section of the Cincinnati Society of Natural History.]

If the camera is intended for both time and instantaneous work, it should have a pneumatic shutter placed close to the other one, to be used as needed.

The plate holder next demands our attention. There are three or four different kinds at present in use, but for his purpose the amateur will find that known as the feather weight to be the best, as it is much lighter and occupies less space than the others.

As to external form of the cameras, it has much to do with the success of the operator. If he does not wish to be discovered taking notes he must eschew all bright brass and mahogany, and content himself with a plain leather or cloth covered box, which could be wrapped in a piece of paper, leaving the ends open, or inclosed in a false cover resembling a travelling bag or a set of school books, without interfering with its work. Other forms of disguise may suggest themselves as necessity may require.—*Anthony's Photographic Bulletin.*

Notes.

When our Royal Academecians realise that the portraits which they paint to order for their customers are seldom so good as to deserve a place in our principal annual exhibition of works of art, we shall have one irritating element eliminated from the show at Burlington House. To enter No. 1 room, and to see, as mainly prominent, No. 67, "Portrait of Mrs. Joseph," by Orchardson, and No. 81, "Portrait of Mrs. Pringle," by Pettie, is certainly a painful experience. One cannot shut one's eyes to the fact that the latter is awkwardly posed, patchy, and apparently an unfinished production—far inferior, in fact, to a good photographic enlargement; and the former is crude in execution, stiff, and like a photograph made by a photographer whose chief ability is to mesmerise his sitter into uncomfortableness.

It is not that Orchardson and Pettie cannot paint, and paint well; indeed, Pettie's "Two Strings to her Bow" (No. 152) may perhaps be regarded as the gem of the collection; and Orchardson's "First Cloud" (No. 291) is a masterpiece, but so much in the old groove of this artist as to be, perhaps, less appreciated than it merits.

In the first room, and nearly opposite to the commercialist portraits we have referred to, is a delightful picture by Millais (No. 25), "The Nest." Mother holds up the little girl—a child just beyond the puddingy and amorphous stage of babyhood—to see the nest and its tenants; and, apart from the careful execution of the whole, the great charm of the picture rests in the expression of mother and child—the former absent, and apparently thinking of something else, while the latter is stirred with eager and almost fear-stricken curiosity at the new sight.

We hope to say more of the Academy next week.

The statement in the *Daily News* of Monday, that the spot where the Schnaebele incident occurred had been photographed by both German and French photographers, was rather puzzling, because, the whole question at issue turning upon the point as to which side of the frontier the spot in question was situated, it was difficult to see how photography could settle the matter. The explanation was given in the papers of the following day. It was to test the credulity of the witnesses that the photographs were taken, and, with the care as to details which is so characteristic of the French, the whole scene of the arrest was gone through, an individual of M. Schnaebele's stature personating him, and the group was photographed. As these photographs demonstrate, it is asserted, that the railway where some German navvies were at work is not visible from the scene of arrest, how could these navvies have seen what they allege they did see? But this is not all. The trail on the French side where M. Schnaebele was dragged was photographed almost immediately after the event, and furnishes an important piece of evidence. If the matter be amicably settled on the basis of these photographs, the whole civilized world will owe a debt of gratitude to photography.

A weekly paper has published copies of the photographs (which we alluded to last week) of the bodies of the woman and child supposed to have been murdered by Pranzini. Nothing more horribly repulsive has been ever seen, even in the journal in question. When the sensational artist draws the scene of a murder from imagination, the result is often unintentionally comic; but to copy a photograph literally is another matter. The drawings in question are on wood; but the fidelity of the photograph in regard to the wounds and the agonized expression of the faces has been preserved.

The Camera Club is now an influential and very actively useful photographic society, and it numbers over three hundred members, all amateurs. If it were to open its doors to the commercialist photographer, there would doubtless be great increase of membership, and possibly the Camera Club might take the thoroughly representative position which the Photographic Society of Great Britain did hold a quarter of a century ago. It was then called the Photographic Society of London.

Several schemes which have been talked of and proposed in connection with the Photographic Society of Great Britain, but towards which the executive would take no vigorous action, have been realized by other societies.

Weekly meetings and out-door gatherings are held by the Photographic Club, the Camera Club, and other organizations; while the Camera Club issues a monthly serial which is in every way equal to the Journal of the Photographic Society of twenty-five years ago – and this is saying a great deal.

The greatest triumph of the Camera Club is the establishment of a permanent club house.

All this work might have been done by the Photographic Society of Great Britain, and would have been done by it had the executive been sufficiently in touch with the outside world to perceive the wants of the time.

There is just now a slight movement in the Photographic Society of Great Britain, as one sub-committee has been appointed by the council to consider what can be done to make the Journal really useful, and another sub-committee has been appointed by the council to endeavour to discover such a re-wording of the rules as to make their meaning tolerably clear.

A novel exhibition has been on view at some Roman Catholic schools in Southwark. It consisted of a model of a squalid home in a poor neighbourhood, built up in cardboard to show "How the poor live." The only thing wanting to complete the realism was the presence of the inmates. This is not a bad idea, but it is open to the objection that, after all it, is not the real thing, and no proof of the real thing. It suggests, however, what has not yet been done, namely, the photographing of the interiors of the miserable homes of the very poor, and also the people themselves. The illustrations which the late Gustave Doré drew of the poor localities of London were absurd caricatures, and the artist either did not use his eyes, or did not draw what he saw. Even the much superior work of F. Barnard, who collaborated with G. R. Sims in "How the Poor Live," cannot be said to be so effective as photography would have been.

Purchasing photographic apparatus on the instalment system—just as houses and pianos are now so often bought—has been introduced in Paris, a 600 franc set of apparatus being offered by a firm at 9, Rue de Fleurus, for 100 francs down, and then 50 francs per month till paid for.

The Society of Amateur Photographers of New York has a new President, F. C. Beach having found that bearing the principal share of active management trenched too much upon his time. The new President, elected on the 12th instant, is Dexter A. Walker, and Daniel P. Reid is Vice-President. The Society has expended £700 during the past financial year, and begins again with a balance of about £50.

There should be many more amateur photographers in America than in England, or a paper of general news like the *New York Weekly Herald* would not think it worth while to publish a technical article on indoor portraiture at home. Still our ranks are increasing, and though more attention is paid by amateurs to landscape work, it is quite possible a rage for photographing one's family and friends as a species of entertainment may set in. Indeed, the writer of the article in the *Herald* seems to suggest something of the kind when he sets forth what will be possible in the way of portraiture when our houses are lighted by electricity. While awaiting that happy time, however, the amateur might set to work by daylight, and if the fashion becomes popular, house agents might find it to their advantage to point out how well the drawing or dining room of a certain house is adapted for indoor portraiture. Tricycle houses are now a common adjunct to "villa residences," and why should not the window in one room at least be constructed with a view to photography? If the walls be covered with a paper of a pattern suitable for a background, and the builder be fore-sighted enough to provide a dark room with sink and water appliances, what more can the amateur desire?

Reviews

The Photography of Bacteria. By Edgar M. Crookshank. Illustrated with eighty-six photographs reproduced in Autotype. Price 12s. 6d. (*London: Lewis, 136, Gower Street, W.C.*)

Great credit is due to author and publisher for having the enterprise to produce such a magnificent book as that before us at so low a price. The plates are printed by the Autotype Company (collotype process) in special colours, to more perfectly illustrate the originals, and they are fine examples of photo-mechanical printing.

The text of the book, besides being a substantial working guide to that difficult branch of photo-micrography which consists in photographing bacteria, is also an excellent manual of photo-micrography in general, the best forms of apparatus being figured and described.

The photographs in this work may be regarded as supplemental to the author's manual of "Bacteriology," a book which, though only illustrated with coloured plates and engravings of ordinary style, has already taken a place in the classics of our biological literature.

That the author does not intend to stop in his work we may gather from his preface, in which he refers to th future advantage which may be hoped for in connectic with the use of an apochromatic objective.

We may fairly assume that every biological library and school of importance will secure a copy of this work, and that those photographers who wish to realise how their art can be made to search into the minute, will obtain it.

Bacteriology is perhaps that one branch of investigation which most immediately promises to benefit the human race, and to make medicine and surgery rational rather than empiric arts; hence the importance of the present work will be understood.

Every medical man has had an opportunity of learning to use the microscope, and many are able to use it; all such should certainly possess Crookshank's Photographs. It might be worth while, for the benefit of the general medical practitioner, to issue them as an atlas without that portion of the text which refers to the purely photographic methods of working.

TESTING LENSES.

BY CHAPMAN JONES.

Now that lenses of new form are being introduced into the market, they will certainly be compared with those in general use, and probably some few will attempt to estimate the advantages of the different makes in a more definite way than by merely comparing their everyday results. Although it may appear strange to those who have not considered the matter, it is none the less true that the quality of a lens cannot be determined by an inspection of the picture produced by it. A cunning operator can make an inferior lens appear the better by selecting a suitable trial picture, and we have actually known this to be done, though, perhaps, by accident. In this particular case a street view was chosen where the houses on both sides approached the camera, and, with the same apertures and focal lengths, the better picture was, of course, got by means of the lens that suffered most from curvature of field. For that particular view, this fault was a virtue, and the results were accordingly deceptive.

Unless the difference between lenses is very marked, it takes a long time and very shrewd analysis of their ordinary routine productions to form any usefully correct judgment of the comparative merits of the instruments. Any one can distinguish a knob of glass from a lens, but to decide between two lenses made by reputed makers requires far more knowledge and experience than would suffice to make some photographers equal to the task of producing pictures fit, in their own eyes, for the walls of an exhibition. Indeed, if one may be allowed to judge, there are probably many who own cameras at the present time who would never be able to make the necessary observations. The veteran worker with the microscope or spectroscope sees what the novice cannot find even when his attention is drawn to it. The eye must be trained to see, and the hand to work, before either the observation or the manipulation is accurate enough to merit the name of scientific.

Although it is no more possible to test lenses than to amputate limbs by only following written instructions, it may be useful to those who are trained to make scientific observations to indicate the methods of getting at the chief points of lenses so far as they concern the practical photographer. The results will be of value only so far as they are comparative, because a perfect lens is an impossibility.

In almost every lens, except the single lens, the mount is more or less in the way. It acts as a diaphragm towards the edges of the plate, and is thus the chief cause of the rapid falling off of the light there when large apertures are employed. This defect may be estimated by fixing the lens on a camera and racking out the focussing screen to its proper position for the lens, or focussing some distant object. The screen is then thrown back, the eye is brought to the place formerly occupied by one corner of it, and the stops are put in the lens one at a time, beginning with the largest, until one is found that appears its true shape, because its opening is not at all hidden by the mount. This stop is the largest that should be used for general landscape work with the full-size plate, and the smaller the figure got by dividing the diameter of this stop into the focal length of the lens, the more satisfactory is the instrument in this matter.

We can tell if the combinations in a doublet are truly mounted with regard to each other—that is, if the centring is correct—by holding the lens at arms' length and looking through it at a fairly distant gas or candle flame. The reflected images of the flame should be one behind the other in a direct line. It is not possible to see them all when they are superimposed, but by turning the lens a little to and fro, it will easily be seen whether they gradually come together as they ought. There are six reflected images produced by a doublet that has both its combinations cemented; and in a portrait lens of the ordinary or Petzval construction, in which one of the combinations has its components separated, there are fourteen images produced by reflection that are easily seen, and one other that is a little difficult to find. The number of images is greater than with the symmetrical doublet, because the reflecting surfaces are six instead of four.

The glass itself of which lenses are made may vary in its physical properties. The colour may be compared by placing the lenses, removed from their mounts, on a sheet of white paper, and looking at them in good daylight. It should be borne in mind that larger lenses must generally be also thicker, and that therefore they will appear to have more colour, though they are made from the same specimens of glass as smaller and apparently more colourless combinations.

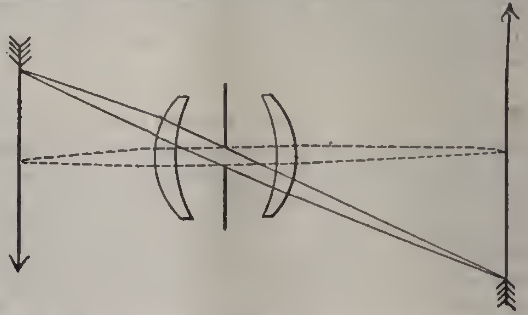
Some specimens of flint glass, especially the denser sorts are liable to form an iridescent film of tarnish upon their surface, and the scattering effect this has upon the light is fatal to good work. If such a film appears after the carefully cleaned lens has been kept in a suitable place—that is, not exposed to deleterious fumes, &c.—for a month, the glass is not good. An otherwise first-class lens may show this defect, and it must not invariably be considered as a mark of carelessness on the part of the maker.

Small bubbles are difficult to avoid in larger pieces of glass, and it would be needless waste of trouble to condemn lenses that happened to suffer in this way. Although bubbles are not desirable, the photographer need not trouble about one or two if their size bears a very small proportion to the smallest stop, especially if they are near the edges of the lens.

With regard to those matters that are affected by the making of the lens, the presence of a flare spot—that is, a spot of light produced by the lens opposite its centre, which fogs the plates at that part—must at once condemn any instrument. This fault may, perhaps, be easily cured by the optician. It should be expected to show chiefly in outside work, especially when a bright sky forms a part of the picture.

The symmetrical doublets of even the best makers sometimes produce a ghost or false image. To test for this, focus a gas flame that is, at least, six or eight times the focal length of the lens distant from the camera, cover the head with a dark cloth, and bring the image of the flame into the centre of the focussing screen. Now carefully turn the camera so that the image moves slowly towards one side, and look for the ghost moving in the other direction, exactly opposite to the chief image. The ghost may not be in focus when the chief image is, but if present it can generally be focussed without difficulty, and then it will be seen to be an erect image of the flame. Although some of the best lenses show this fault, it is obvious that it may prove troublesome, especially in outdoor work; as if, for example, a bright cloud comes on one side of the plate, dark foliage in the foreground on the opposite side must suffer a certain amount of fogging.

If a lens is not ground true, or the glass of which it is made is not homogeneous, its irregularity will cause a more or less irregular refraction of the light, and therefore a blurred image. The amount of blurring may be scarcely appreciable, and as other causes may, and generally will, interfere more or less with the sharpness of the image, this affords no specific test for the trouble in question. By using a small stop, the effect of each part of the lens is localised on the image if we are using a single lens, and with a doublet correspondingly small parts of both combinations work together. The figure makes this clear.



Each pair of lines shows that the portion of the image indicated is produced entirely by small parts of the two lenses. Now if a part of either lens that is not much smaller than the stop used is too flat or raised into a bump, or is otherwise irregular, that part of the image that depends for its production upon that part of the lens will be out of focus or blurred. Perhaps a clean sheet of newspaper is the handiest object to make this test with. It must be flat, square to the camera, its centre in a line with the axis of the lens, and, if possible, facing a window, that the whole surface may be evenly illuminated. As the image produced on the ground glass when a small stop is used is not often bright enough to examine critically, and is always interfered with by the grain of the ground glass, it will be necessary to make a negative and examine that instead. There may be a slight falling off of definition towards the edges, but this should be uniform at any given distance from the centre of the plate. The negative should be examined under a lens, and if a part is found that is not well defined, and the original object shows no sign of having been the cause of the irregularity, we may conclude that the lens is at fault.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

5797. William James Smith, 11 and 12, Broad Street Corner, Birmingham, for "Portable photographic camera for long and short focus lenses."—21st April, 1887.

5812. William Dyke Wilkinson and Frederick Fowler, trading as W. Dyke Wilkinson and Co., 216, Bradford Street, Birmingham, for "An improved photograph or picture holder."—21st April, 1887.

5843. Henry Hardinge Cunynghame, 1, Queen Victoria Street, London, E.C., for "Improvements in photographic cameras."—21st April, 1887.

5902. Thomas Rudolph Dallmeyer, 24, Southampton Buildings, London, W.C., for "Improvements in photographic lenses."—22nd April, 1887.

5923. George Sallnow Martin, Birkbeck Institution, Bream's Buildings, Chancery Lane, for "Controlling the action of instantaneous photographic shutters with detent spring."—23rd April, 1887.

Patent which has become Void through Non-payment of the Fifth Year's Renewal Fee.

124 of 1882. L. H. Philippi, "Reproducing on metal engravings by photography."

Specifications Published.

6431. John Thomas Key, of Machon Bank, Sheffield, in the county of York, Civil Engineer, for "Improvements in apparatus for holding and exhibiting views and the like, in magic lanterns."—Dated May 13th, 1886.

My invention has reference to an improved method of holding photographic views and the like, mounted as magic lantern slides, and for automatically placing the said views or like objects in the correct position before the lens with regularity and precision.

In carrying out my invention, I mount any desired number of photographs, painted subjects, or similar "slides" in a circle, preferably by cutting out a series of suitably shaped apertures in a disc of cardboard, papier maché, or other material, and either permanently fixing the subjects therein, or making them removable so that they can be changed when necessary.

The disc is provided with a centre hole, so that it can be secured upon the end of a spindle projecting from a case containing suitable mechanism which when wound up will cause the said projecting spindle to revolve and carry with it the disc.

The mechanism or clockwork may be of any construction so that it is suitable for the purpose named, and it must be so contrived that its speed of travel may be varied at pleasure, and be instantly stopped and started whenever desired.

The case containing the mechanism may be permanently attached to the lantern or be separate therefrom, and its position may also be varied.

For example, the said case may be fixed in a position above the lens slide in front of the chimney, and so that when the disc is fixed upon the end of the projecting spindle the lowest subject shall be exactly in position with the lens of the lantern. On starting the mechanism, the disc revolves and the various subjects or slides are successively brought before the lens; if desired the motion may be intermittent like the seconds finger of a clock, having a rapid movement while changing the subject, and then resting or stationary for a time, or it may be slow and continuous.

6590. Richard Mander, of Branston Street, Birmingham, in the county of Warwick, Manufacturer, for "Improvements in frames for holding photographic and other pictures."—Dated 17th May, 1886.

The patentee says:—

My invention relates to frames or holders for photographic and other pictures, and particularly of the kind known as screen frames, in which two or more enclosing frames are connected together, so as to hold a series of pictures both back and front, or front alone, and which said combination of frames are arranged to fold up or turn one upon another, screen or book like; and the principal object of my invention is the jointing and general construction of such frames as hereinafter described.

In carrying out my invention, I proceed as follows, and I will describe my invention in connection with a double screen, or a photographic screen in which two frames are jointed to a common middle support or pillar.

The middle pillar support consists of a piece of tubing of the exact height of the frame to be made, with its ends screwed, or provided with screwed plugs, which extend a little beyond the ends; and upon the opposite sides of the said pillar, hollow beadings or knuckles extend to within a short distance of the ends, and within these hollow beadings the joint pin or wire upon which the frames turn is secured.

The ends or outsides of each frame are constructed exactly the same as the middle pillar or support, with the exception that the knuckle beading is only upon the inside edge, instead of upon the two edges, as described.

The tops and bottoms of the frame are made of troughed drawn metal of a V section, with a hollow beading or rib upon its outside edge, and these top and bottom parts I call the carrier ends, from the fact that they embrace and secure the photographs and glasses within the sides of the frame. These carrier tops and bottoms have return ends of the same cross section as the other part. These return ends are of a length equal to the distance between the ends of the pillar and sides and the ends of the beadings carried by them, so that when the carrier or bracing ends are placed in position, the holes in the beadings of the return parts pass over or on to the joint pins or wires extending from the ends of the pillar and side beadings—that is, the beadings of the pillar and sides become coincident with the beadings of the return ends of the tops and bottoms before named, so that the hollow beadings of both parts constitute the knuckles or joint centres upon which the two flaps or frames turn. The carrier or bracing ends are bound and kept to the other parts constituting the frames by screw caps or screw terminals, taking upon the ends of the tubes forming the middle pillar and sides. The bases of the said caps or terminals are made broad, so as to slightly overlap the tops of the frames.

Instead of having simple beadings upon the sides of the tubes forming the middle and ends of the frame, enclosing sides of the cross section of the top may be employed instead. In this case the inside edges of the frame are made continuous or uniform in character.

The middle pillar with its two side beadings, the sides with the single hollow beading, and the bracing ends or tops and bottoms, with their hollow beadings, are respectively made in one piece, by the process of drawing through, or by rolling. Or the knuckles may be attached if necessary, separately, by soldering or otherwise.

By constructing photographic screens as described, the frames are made up of segments or parts, which when put together, are hinged upon a middle stile or support.

Instead of a two-fold screen, a three, four, or any other desired number may be made in the same way, by providing the inside uprights with double beadings or knuckles to form the joints upon which the adjacent frames turn upon as joint centres, for folding up or opening out.

To introduce a photographic or other picture, remove the terminal caps from either the tops or bottoms of the uprights, then remove or draw the enclosing top or bottom from off the pins or wires forming the centres upon which the sides turn; when this has been done, slide the picture or photograph between the uprights, with its forward end resting within the trough of the embracing end not removed, then place the other end in position and secure it down by the terminal caps.

Although I have described my invention in connection with a double frame or screen, yet my said invention is equally applicable to the making up of single frames.

7156. Arthur Samuel Newman, of 87, Evershot Road, Finsbury Park, in the County of Middlesex, Electrician for "Improvement in photographic shutters."—Dated 27th May, 1886.

The Patentee says :—

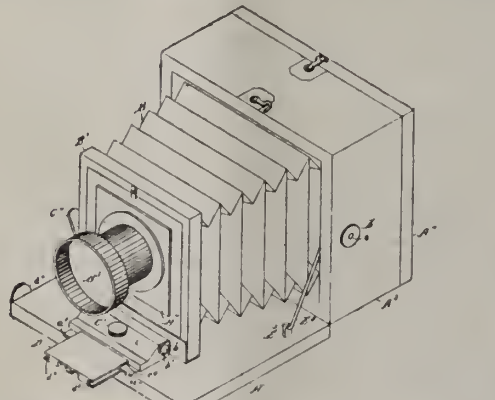
In carrying out my invention, the shutter (which may be of the ordinary kind used for rapid work) is connected to a loosely fitting piston moving up and down in a metal cylinder into which the air enters, and the time of exposing is governed by the rate at which the air is forced out and re-enters the cylinder. This is effected by means of a series of perforations of graduated size in the top of the cylinder, over which a cover revolves so as to cover or to expose the whole or only a part of such perforations; the larger the extent of the perforations exposed, the more rapid is the action of the shutter, and the shorter the exposure.

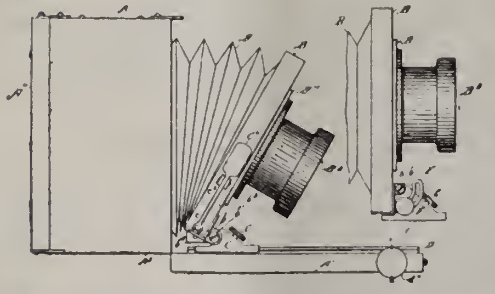
A slot or aperture of graduated size may be cut in the top of the cylinder in place of a series of holes.

The actuating mechanism consists of a convolute wire spring, or watch spring which is wound up by an axis, or stud on the frame of the shutter, one end of the spring being attached to the rotating stud, and the other to the fixed plate or frame. A bar is fixed on the end of the rotating stud, one end of the bar being connected by a link or rod to the piston, and by which it is moved up and down in the cylinder when the stud is turned. When the stud is turned half a revolution a projection on the end of the arm engages with a catch on the letting off lever, and retains the shutter wide open for focussing; another half revolution action to close the shutter again, the spring at the same time being wound up, and retained by a projection on the other end of the bar engaging with the same lever catch as before.

Patents Granted in America.

360,249. Allan C. Sargent, Granite-ville, Mass. "Photographic camera." Filed July 19, 1886. Serial No. 208,414. (No model.)





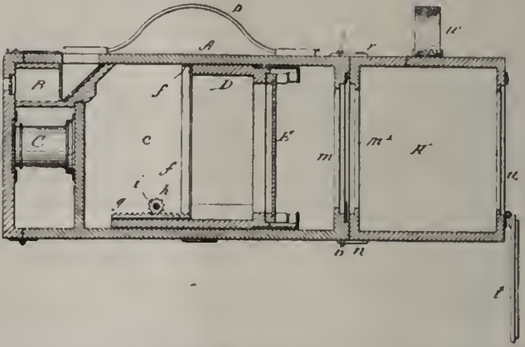
Claim.—1. A photographic camera contained within a rectangular case, one side of said case being adapted to be turned down into a horizontal position to form the base, ways secured to said base, a rack adapted to be moved to and fro on said base between said ways, and a slide adjustably secured to the front piece of said camera, and adapted to be moved to and fro on said rack, substantially as described.

2. A photographic camera contained within a rectangular case, one side of said case being adapted to be turned down into a horizontal position to form the base, ways secured to said base, a rack adapted to be moved to and fro on said base between sai ways, and a slide adjustably secured to the front piece of said camera, to which one end of the bellows is attached, and adapted to be moved to and fro on said rack, the outer end of the bellows being secured within the case which forms the swing-back, said swing-back being hinged to the base, so that it may be adjusted to any required angle with the base, substantially as shown and described.

3. In a photographic camera, a rack adapted to be moved to and fro by means of a pinion and thumb-nut, a slide adapted to move length-wise upon said rack, said slide being adjustably secured to the movable front of the camera, as and for the purpose specified.

4. In a photographic camera, the combination of a case having one side thereof adapted to be turned down to form a base to which the swing-back is adjustably secured, a rack, a pinion, and thumb-nut for operating said rack, and a slide attached to the moveable front of the camera and adapted to move to and fro upon said rack, substantially as described.

360,314. William H. Lewis, Brooklyn, assignor to E. and H. T. Anthony and Co., New York, N.Y. "Photographic camera." —Filed December 28, 1886. Serial No. 222,790. (No model.)



Claim.—1. In a photographic camera, the combination, with the camera box or body, of a ground-glass and plate-holder carrier adjustable within and along said box to and from the lens of the camera, means adapted to adjust said carrier from the exterior of the box, and an exposed attached index and dial for determining said adjustment, substantially as specified.

2. The combination of the camera box or body A, having an opening closed by a lid or door adapted to provide for the transverse insertion and removal successively of a focussing ground glass and a plate-holder, the stationary lens-tube C, the ground-glass and plate-holder carrier D, adjustable within and along said box to and from the lens, the rack *g*, attached to said carrier, the pinion *h*, engaging with said rack, the pinion spindle *i*, arranged to extend through the camera-box to the exterior thereof, the index *k*, the dial *l* upon the exterior of the box, essentially as described.

3. The combination, with a camera-box open in its rear, of a detachable and convertible hood and sensitized-plate-carrying receptacle, substantially as specified.

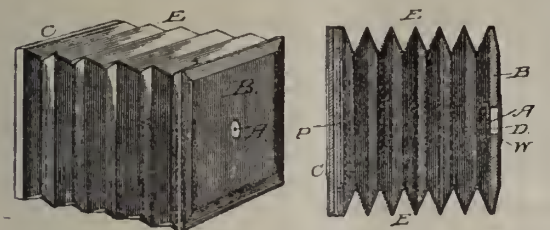
4. The combined hood and plate-carrying receptacle or case H, made readily attachable to and detachable from the rear open end of the camera box or body, and virtually forming a detachable extension of said body, the same being adapted to carry a series of sensitized plates or plate-holders for separate use, as required, within the main portion of the camera-box, and being provided with front and back openings, *m' u*, and lids or doors for closing said openings, essentially as and for the purposes herein set forth.

5. The detachable combined hood and plate-carrying receptacle H, for photographic cameras, having openings *m' u* in its opposite ends or faces, lids or doors closing said openings, and a separate opening adapted to provide for the insertion and removal of said plates, and a lid or door closing said separate opening, substantially as specified.

360,499. Alexander P. Whittell, San Francisco, Call., "Photographic apparatus."—Filed March 13, 1886. Serial No. 195,097. (No model.)

Claim.—1. A portable photographic apparatus consisting of a folding, extensible, and light-tight box having a minute aperture made in the front, in combination with a sensitized plate or film within the box opposite the aperture, and permanently fixed, whereby its removal necessitates the destruction of said box, substantially as herin described.

2. A folding, extensible, light-tight box, having a small aperture, and a sensitized plate or film permanently fixed within it,



so that the removal of the plate necessitates the destruction of said box, in combination with a removable adhesive patch or wafer for covering the opening, substantially as herin described.

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BLACK AND WHITE NEGATIVES ON GELATINE EMULSION.

The advocates of the collodion process deny the possibility of making black and white negatives for process work, upon gelatine emulsion plates. It is said by them that owing to the want of perfect transparency, gelatine plates can never give the sharpness and clearness which a collodion plate is capable of showing. Many difficulties occurring with photographic processes have in course of time been successfully removed, then why should those occurring in the making of black and white negatives upon gelatine plates not also be overcome?

We have been recently told that a collodion plate enlarged by the solar camera, or upon the permanent bromide paper, gives, in the average, more brilliant and sharper results than gelatine negatives, owing to its greater and more perfect transparency in the shadows. This quality, it is true, is more rarely found in the same perfection in the gelatine negative. But let us compare a bromide enlargement with the original negative, or examine a good example of the modern dia-positive, and we will see, in the latter especially, a transparency and density in shadows, details in lights, and precision in sharpness in lines, which can bear comparison with the best products of the collodion or albumen film. A still better test is applied in microscopic work, and on the lantern slide, which enlarged to enormous dimensions, present the same excellent qualities and photo-chemic effect that we observe in positives on glass. The question may arise why, when density and transparency can be produced upon plates of small dimension, it cannot be obtained upon sizes as large as a double page of a newspaper. To this question we answer that the highest possible intensity has been gained with gelatine plates of all sizes, and there is no reason why under favourable conditions a skilful operator cannot do so at any time.

There are several reasons for the employment of gelatine plates in process work; prominent among which stand their extreme sensitiveness and the rapidity with which they may be worked. A dry plate is naturally better adapted for long exposures, as with it there is no danger of spoiling by the drying of a plate when long standing, or the formation of "oyster-shells" and the other kindred annoyances. When one considers that for reproductions of large objects in natural size, for which a very long focus objective is required, as much as from 15 to 60 minutes and even more time frequently is necessary, and which time increases with artificial light, it must be wondered that the gelatine plate has not been substituted for the collodion, and has not been accepted by all process operators before now.

Photographic technics have so far advanced, that, with the skill of an average operator, the making of black and white negatives upon gelatine plates has passed the experimental state. To reverse negatives or to strip films is equally within the reach of all, and as to the drying of them quickly, fan-wheel arrangements, like those used in dry plate works and already installed in many photo-mechanical printing establishments for the uniform and rapid drying of bichromatized gelatine plates, can be made available.

Of the methods employed to gain the highest intensity upon gelatine plates, that proposed by Mr. I. O. Moerch, in his very practical book on photo-chemigraphy, deserves our closest attention. Although he also expresses himself in a general way in favour of collodion, the results obtained upon gelatine plates, he states, are highly satisfactory.

The first condition for success is a good and sound emulsion of but moderate sensitiveness. Highly sensitive plates are not commendable for line work, as with them fog will appear with the slightest forcing in the development. Dr. Eder's ferrous oxalate is preferable to all other developers, but requires besides the addition of 50 drops of a solution 1 part iodine, 1 part of iodide of potasium in 150 parts of water, to every 8 ounces of the oxalate solution. With appropriate exposure, proportionally longer than with a collodion plate, and a judicious amount of bromide of potassium added to the developer as soon as the image appears, a sufficient density can be attained by the developer alone. Gelatine and albumen solution acidulated with acetic acid preserves the sharpness and clearness of lines to a wonderful degree.

If not sufficiently intense, negatives developed in this manner can be strengthened by immersing them first in a solution of 16 grains chloride of ammonium, 1 dram of bichloride of mercury, and 24 ounces of water, till the whole deposit has turned perfectly white, and then by pouring over it, after a perfect washing, a solution of 30 grains cyanide of potassium, 15 grains of iodide of potassium, and 15 grains of bichloride of mercury, in 7 ounces of water. With the second solution, intensity increases to a certain point only, and the reducing power of the cyanide begins gradually to show. Thus the character of the negative may easily be determined by the operator.

The method of Dr. Eder, by which negative plates can be intensified without injury to line or stipple, is very interesting. The negative is bathed in a three per cent. solution of bichromate of potassium for about three minutes, blotted, dried in the dark, and hardened in daylight. To do this, the negative may be exposed under sensitized albumen paper till a weak picture appears. During that time the light has sufficiently acted to render the gelatine hard enough to withstand the action of certain reagents, when the bichromate is thoroughly washed from the film, and the negative subjected to any of the ordinary methods of intensifying. The hardened gelatine prevents any deposit of fog, and the lines consequently remain clear.

As repeatedly mentioned in these columns, the Carbutt plates of lower sensitiveness show very fine qualities for black and white or highly intense negatives, as well as for positives. The A plate, extensively used for lantern slides, gives negatives of lines or stipple to perfection, provided it receives proper treatment and manipulation. With them, as with any other brand of plates, the degree of sensitiveness and a correct time of exposure are of the utmost importance, ultimate success depending upon them. Mr. Carbutt uses the iron developer considerably acid; in fact, he adds to 40 ounces of the standard oxalate of potassium solution 60 grains of citric acid, an amount which, in exceptional cases, has been increased. The developing formula given by Mr. Moerch acts very well in making black and white negatives upon Carbutt plates, but requires restraining as soon as the picture begins to show. We have been told that boric acid excels the bromides in doing such work.

Intensifying should here be considered as a *dernier ressort*, as in most cases the plates are dense enough without after treatment. An over-exposed plate can never gain sufficient density without injury to lines, and when under-exposed, the finer lines and more delicate stipple will close up, and be destroyed. In either case it is best to make a new negative. If, however, extreme cases occur, where intensifying cannot be avoided, Mr. Carbutt's method of toning lantern slides gives fine effects. He uses three solutions, in the following proportions: (1) $\frac{1}{8}$ ounce bichloride of mercury, $\frac{1}{2}$ ounce of chloride of ammonium, dissolved in 20 ounces of water. (2) 1 ounce chloride of ammonium, dissolved in 20 ounces of water; and (3) two separate solutions, one of $\frac{1}{4}$ ounce of cyanide of potassium in 16 ounces of water, and the other 100 grains of nitrate of silver dissolved in 4 ounces of water, adding the silver solution to that of the cyanide until a slight precipitate remains undissolved.

After all hypo has been washed from the plate, it should be flooded with No. 1 till the deposit has turned white, by viewing it from either side of the plate; then wash and immerse with No. 2 for several minutes; wash again and flood with No. 3, when the plate will turn intensely black. With this method a perfect transparency and the finest sharpness are retained.—*Photographic Times*, January 28th, 1887.

Correspondence.

THE BIBLIOGRAPHY OF PHOTOGRAPHY.

Sir,—I am gratified to find that my articles on the books which have been written in connection with photography appear to have excited a somewhat general interest, as is evidenced by the numerous communications with reference to them which have appeared in the last two or three numbers of the News.

First, with regard to Mr. John Spiller. He appears, to some extent, to assume a monopoly for the name of "Spiller" in photography—a fact at which I am not surprised when I remember the number of times that I have come across his name while poring over the records of our science ever since 1854. But if Mr. John Spiller will turn to the number of the Photographic News in which the description of his namesake's book appears (Feb. 19, 1886, p. 115), he will find the "Photographic Poems" duly credited to C. C. Spiller, who then lived at 102, Holborn Hill. I am indebted to Mr. Newton for the information that this Spiller's son was a photographer, as it supplies the motive for the father's choice of the word "photographic" for his poetry.

Mr. Lang has probably not read the introductory chapter to my "Bibliography" (see Photographic News, Jan. 1, 1886, p. 9), in which it is shown that it is necessary to divide the literature of photography into five classes. Of these only Class I.—printed books dealing mainly with photography—has as yet been published. If I remember rightly, Fox Talbot's "Sun Pictures in Scotland" contains no letterpress—or, at least, nothing referring to photography. I consider it, therefore, to belong to my Class V.—important books illustrated by photography. The periodicals Mr Lang mentions—the *Chemist*, the *Art Journal*, and the *Photographer*—belong to my Class II. (periodicals relating to photography), and will duly appear under that head.

Ure's Dictionary I give under the best and "revised" edition, that of 1875. A supplementary volume was published in 1878, together with a reprint or re-issue of the three other volumes. My MS. note of the date of the fifth edition gives it as 1860.

But how could Mr. Lang think I could have omitted so important an article as Captain Abney's in the *Encyclopaedia Britannica* for 1885? Is it not duly chronicled in the Photographic News for July 9, 1886, p. 437? I quote it here:

"1885, Abney, Capt.: Article on Photography; *Encyclopaedia Britannica*, Ninth Edition, 4to., vol. xviii., Part 72, pp. 821-40. Price of vol., 30s.; of part, 7s. 6d. A. and C. Black, Edinburgh."

I strongly recommend everyone to get the Part here mentioned, as I consider this article the best the able author has ever written.

I feel greatly interested to Mr. Samuel Fry's account of his brochure on the "Moon as Shown by Photography." I accept with pleasure his kind offer to send me a copy of the book for inspection and description. Until I see it, however, I can hardly say whether it will fall into my Class I. or Class V. If it includes an account of the photographic methods adopted, it will belong to Class I.; if only a description of the moon astronomically considered, to Class V.

In conclusion, I would again ask photographers generally to examine my lists, and let us know of any additions or corrections. W. Jerome Harrison, F.G.S.

PS.—I see I have omitted to reply to Mr. Lang's query *re* the eccentric Frenchman, Tiphaigue de la Roche. Tissandier, in his "History and Handbook of Photography," which has long been a standard book in France, quotes from the edition of 1760 without the least hesitation, so that I consider the quotation authentic.

Dear Sir,—In the list of photographic publications given by Mr. W. Jerome Harrison I observe that Mr. Jabez Hughes's book, "The Principles and Practice of Photography," is omitted; in all probability inadvertently, but I think it important enough to call your attention to the fact. I don't suppose that any other work on photography has had so large a circulation. It was first published in 1860, and has since run through no less than thirteen editions of not less than five thousand each, and I think I may safely say that no one did so much as the late Mr. Jabez Hughes to popularise photography.—I remain, dear sir, yours truly, J. Werge.

Proceedings of Societies.

Photographic Society of Great Britain.

A technical meeting was held in the Gallery, Pall Mall East, on Tuesday last, the 26th inst., W. England, Vice-President, in the chair.

C. Jackson demonstrated the mode of using the Eastman stripping films, after which H. Trueman Wood exhibited a portable electric lantern, as constructed by Pitkin. A small accumulator served to put the lamp in action, and suitable screens made it suitable for use in the dark room.

A form of plate holder designed by Messrs. White was shown; the plate being held at the end of a handle, so as to enable the worker to rinse and manipulate the plate without being inconvenienced by the water and other fluids.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 21st inst., H. S. Starnes in the chair.

An untoned print made last September on a commercial ready sensitized paper was shown by E. Clifton. This had discoloured considerably; but another print of the same age recently toned with a borax bath was very good, proving that discolouration under some conditions is not of much consequence.

It was contended by A. L. Henderson that freshly sensitized paper and an acetate of soda toning bath gave the best results.

Two remarkably good series of well chosen subjects printed in platinotype were exhibited by J. B. B. Wellington and C. H. Cooke respectively. The negatives were taken at Eastertide in the vicinity of Sussex, and the plates were home-made.

Some other examples of platinotype printing were shown by F. W. Cox, but the especial feature of novelty in this case was the circumstance that a cold saturated solution of washing soda had been employed to develop the prints, and notwithstanding the fact of some of the paper being six months old, a very presentable result was obtained.

J. B. B. Wellington read Dr. Eder's remarks upon those agents capable of developing platinotype prints, among them being washing soda. Plain water he said would act similarly, if sufficient exposure were given.

The Chairman drew attention to a grooving plane he had constructed for making negative racks, and it was stated by A. Cowan that the cost of such a tool would not exceed five shillings.

On Thursday next, the subject for discussion will be, "The Variations of Developing Action as tested by Spurge's Sensitometer."

Camera Club.

On April 21st, an address was delivered by T. Bolas on "Photographic Processes for Book Illustration," and was accompanied by the exhibition of a series of blocks and prints in illustration of the subject.

Lyonel Clark occupied the chair, and, previous to calling upon the lecturer, drew attention to a simple instrument for timing exposures.

T. Bolas then entered upon a description of the processes suitable for printing with type, and treated of methods in regard to lithographic and zinc work, solid photographs, and the means of obtaining granularity. Pretsch's work of twenty-seven years ago he considered had hardly been surpassed. Dallastint was called a secret method, and would, considering its merits, probably have been much more widely used could it have been fully pushed. Blocks and prints of Woodburytype, Dallastint, Bullock Brothers' work, Ives's process, and collotype were handed round.

J. C. Geddes pointed out how amateurs might make blocks from their own negatives, and referred to the great pleasure sure to attend such work. He gave a descriptive account of the collotye process, and exhibited prints from blocks prepared from Eastman's stripping films, which he strongly recommended as being usable from both sides.

T. Bolas remarked that it was a necessary thing to be careful to obtain reversed negatives, and he drew attention to an illustration in an American journal as a fearful example, where the subject was a figure writing with a gigantic left hand, and the picture was furthermore defective for several other reasons.

J. Traill Taylor did not know what they could put up with in America, but he would like to show some specimens of collotype work done there which he would venture to say were equal to anything done in this country. He had seen it done, and the work was of the simplest description. A smooth and not ground-glass surface was employed. [The prints exhibited were of very fine finish, and, having a burnished surface, could hardly be distinguished from direct photographs.] Mr. Taylor then described a printing process suitable for amateurs, a copper cast being finally obtained.

W. E. Debenham said that when in Munich, Albert was using only plain glass.

The Chairman said that the addresses of Messrs. Bolas and Geddes had opened up quite a new field for amateur photographers, and doubtless many present never considered it possible for amateurs to produce printing blocks without going in for a most expensive outfit. He should like to have heard of one or two other processes, examples of which he had come across in the journals, such as that of Fox Talbot, and a French (Joubert's) method, a carbon process.

T. Bolas described Talbot's process, in which a copper plate is etched by perchloride of iron through a film of bichromated gelatine. The French method (Joubert's) was a collotype process. Goupil's was similar to Woodbury's, and a roughened gelatine was used.

After some remarks from L. Greathead, the proceedings terminated with a vote of thanks to the lecturer and Mr. Geddes.

The next Club excursions will be to Gomshall, Wooton, and Abinger, on May 14, and to Westerham on June 4, both Saturdays.

North London Photographic Society.

At the meeting held on April 19 at Myddelton Hall, L. Medland in the chair, J. Bird, A. Liddle, and A. Wybrant were elected members of the Society.

A number of views taken at the Easter Monday outing at Maidenhead were exhibited.

F. W. Cox showed some platinotype prints for the development of which he had used a cold solution of common washing soda instead of the oxalate of potash usually employed.

George Smith exhibited a quarter-plate camera with a series of lenses of varying focus especially suitable for making lantern-slide negatives.

A large number of slides was then exhibited by means of the optical lantern.

The Chairman announced that on May 3, Alexander Mackie would lecture on "The A B C of Photographic Emulsions." Visitors invited.

Manchester Amateur Photographic Society.

The monthly meeting was held on Tuesday at the Masonic Hall, the Rev. H. J. Palmer in the chair. The following were elected members :—W. Bolton, T. Morley Brooke, C. F. Budenberg, J. M. Frankish, A. Hamilton, M.D., Walter Noar, and James Shaw. The secretary announced that he had received the names of the first lady candidates for membership. The members now number two hundred.

J. G. Jones read a paper on "Gas Bags *v.* Gas Bottles," describing the advantages, and comparing the first cost and also the cost per hour of each system of lantern illumination. In the course of his paper Mr. Jones called attention to an account of a meeting of the Manchester Photographic Society, printed in the photographic journals, in which Mr. Jones is reported to have said that " I could not dissolve because the high pressure was too great on the dissolving taps." In contradiction of this Mr. Jones mentioned that at the soirée of the Manchester Amateur Photographic Society, held in the Athenæum in December last, the whole of the views shown were dissolved by means of the taps at the back of the lantern. After the discussion by the members of queries taken from the question box, J. E. Thornton exhibited his patent roller slide, and explained its working, and also exhibited a small detective camera, intended to be used for instantaneous exposures on the occasion of the visit of the Prince and Princess of Wales to open the Jubilee Exhibition.

Lachlan M'Lachlan, by request, exhibited a negative and prints of his large photographic group, "The Royal Family at Windsor," and gave some details of the work in taking the same. The members were given an opportunity for inspecting the large negative, which was a remarkably fine one, and capable of yielding prints four feet four inches by two feet two inches.

E. Briggs showed a series of lantern slides, using the lantern recently presented to the Society.

Yorkshire College Photographic Club.

On Tuesday, April 19th, this Society held a Conversazione and Exhibition in the Museum of the Textile Department of the College, which had been suitably draped for the occasion. There was a large gathering of members and their friends. The President of the club (C. H. Bothamley, F.I.C., F.C.S.) opened the proceedings with a short address, in which he pointed out the chief features of the exhibition, and then gave a short account of "The newest development in photography," in which he explained the principle of orthochromatic photography, and showed, by means of a lantern, specimens of the results which can be obtained. A selected series of lantern slides by various members was then exhibited.

Although the number of members in the club is small, a large number of prints were exhibited, some members having contributed liberally, and all the exhibits were up to a very good standard.

The President showed a series of silver prints illustrating places visited by the British Association in 1886 ; some examples of contact prints on Eastman paper ; and a fine series of platinotypes, one of which, a successful rendering of sunshine breaking through the mist on a river, was much admired. The Secretary (Harry B. Hall) exhibited some excellent enlargements on Eastman paper, and a number of quarter-plate "bits" mounted in sets which illustrated the power of small plates in capable hands. A. E. Nicholls showed a number of silver prints which included some admirably artistic studies of agricultural life, and some clever renderings of geological subjects. Mrs. J. Knight and Miss S. E. Knight showed a number of silver prints and platinotypes, amongst which the most noteworthy were some clever figure studies and some platinotypes of interiors, remarkable for their delicate rendering of minute detail. Dr. E. H. Jacob exhibited several enlargements, amongst which were two artistic studies of a child. The Rev. R. W. Atkinson, M.A., exhibited an album of silver prints and platinotypes, the most notable being some excellent views in Norway. T. Harrison showed a number of prints on Alpha paper, and some silver prints by the ordinary process. Percy Lund showed contact prints on Eastman paper, which included some studies in Melrose Abbey, and a realistic group of a donkey and street boys. F. W. Parkin showed examples of the same subject, printed on albumenised paper and Eastman paper, not altogether to the advantage of the latter. A. Cooper exhibited some reproductions of pictures in cyanotype. Prof. A. Smithells lent a large series of specimens of chemicals used in photography, and Messrs. Reynolds and Branson exhibited some of the best typical forms of photographic camera. The exhibition remained open on the following day.

Photographic Society of Philadelphia.

A meeting of the Society was held on April 6, with President Frederic Graff in the chair.

A question in the box asked : "Is there any method of toning positives on glass ?"

It was stated in reply that lantern slides were frequently toned in solutions of sulphuret of potassium, bichloride of palladium, and bichloride of platinum.

Mr. Walmsley suggested slightly under-printing the slides, bleaching with bichloride of mercury, and then toning with sulphite of soda. As the latter acts as an intensifier, it is necessary to print light, or the slide will be too dense.

Mr. **BARTLETT** wished to call the attention of the members to an intensifier for gelatine plates which he had received from John G. Cassebaum. It possessed marked advantages over mercury, being gradual in its action, perfectly under control, and affording any degree of intensity required, without interfering with the printing qualities of the negative. It is necessary to submit the negative to be strengthened to a preliminary bath to make it slightly acid. This bath consists of

Nitric acid	10 drops
Chrome alum	1 ounce
Water	20 ounces

Citric or acetic acid may be substituted for the nitric, in the proportion of 1 ounce to 20 of water. Stock solutions are made as follows:—

A.—Gallic acid	120 gr.
Alcohol	1 ounce
B.—Silver nitrate	30 gr.
Water	1 ounce

One drachm of each of the above solutions is added to each ounce of water. The plate is put in an ordinary developing dish, and the solution poured over and gently rocked to and fro. The negative will gradually come up, and may be carried to any degree of intensity. Mr. Bartlett also mentioned the investigations of Dr. Lohse, on the modifications of the alkaline developers for bromide of silver plates. Dr. Lohse, in his trial of the various alkaline earths, in connection with pyrogallic acid, found that borax (biborate of soda), contrary to his expectations, proved perfectly inert, producing not the slightest action upon the latent image. He further found that even the addition of soda or ammonia produced no action; while the borax remained present, the plate lay perfectly white in the dish. It was only after washing out the borax from the film, that the action began and was completed. The borax does not neutralize the action of the light, but prevents the reducing action of alkaline pyro developer. He accordingly suggests that this salt might be of advantage as a retarder in the developer. Mr. Bartlett, acting upon the suggestion, added one drop of saturated solution of borax to the ounce of developer, and found that the addition acted as a clearer of the negative, without any appreciable retardation of the development.

JOHN G. BULLOCK showed a chart which had been brought to the meeting by a visitor, which was a valuable aid to those who were called upon to photograph buildings or other subjects requiring to be taken from some special point, to obtain the best effect with a certain sized plate or with any special lens. A base-line was ruled across the bottom of the chart, and a perpendicular line down the centre. From the point of intersection, the angles radiated, and were ruled off on either side of the perpendicular line; every five degrees being shown, red and black alternately, making it easier to trall them up. Perpendicular lines were ruled on either side of the centre, at distances corresponding to length of all plates used. The central vertical line was graduated in inches and centimetres. Horizontal lines were laid off, of a length corresponding to the longest plate each lens would cover, and at a distance from the base-line corresponding to the equivalent focus of the lens. The angle line, intersecting lens line and plate line, would give the angle included and the particular size of plate, and any number of lens foci could be laid down, and the angle of any lens or size of plate could be seen at a glance. The chart shown was 22 by 26, but angles of lenses of longer focus could be read by taking half the focus and half the length of plate. He (Mr. Bullock) also mentioned a peculiar circumstance in connection with a copying lens recently imported by Mr. Partridge, a member of the Society. It was found that from some cause, at first unaccountable, every plate exposed with the lens was slightly fogged. New baths and developers of all kinds were tried, and camera and dark-room were carefully examined for cracks where light might leak in. A critical examination of the lens revealed the fact that owing to the angle at which the inner end of the lens mount was bevelled, its extreme inner edge was struck by some of the rays of light after passing through the lens, and they were reflected in the shape of diffused light upon the plate, thus causing the fog. The difficulty was entirely overcome by use of a cardboard diaphragm so placed as to cut off these rays before they reached the reflecting edge of the mount.

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Talk in the Studio.

FINSBURY TECHNICAL COLLEGE.—Outline of lectures during ensuing session to be given by Prof. Meldola. *Photographic Chemistry*—General action of light on bodies; salts of silver (Cl, Br., I., and nitrate); action of light on chlorine (Br. and I.); their preparation, properties, and combination with other elements. *Nature of the Invisible Image*—Developers; theory of development; fixing, and substances useful for same; fading of prints; reasons for stability of certain processes. *Intensification*—Chemicals in use by photographers: their preparation, purification, and general reactions. A special meeting of the Finsbury Technical College Photographic Society will be held at the College, Leonard Street, Finsbury, on May 3rd next, when John Spiller, F.C.S., &c., will deliver a lecture on "Photo-Chemical Reactions." The chair will be taken by Prof. R. Meldola, F.R.S., at 5 p.m. Visitors will be welcome.

PHOTOGRAPHIC CLUB.—The subject for discussion on May 4th will be on "Photographing Animals."

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To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

I. H. JENNINGS.—The omission was, we suppose, purely unintentional; indeed, we cannot suppose for a moment that it was otherwise. We will write to you with regard to the other matter.

RUSSELL STEELE.—1. The second lens that you mention—that is to say, the quicker of the two—would be the best to purchase, as you may sometimes wish to work when the light is bad, or when a patient cannot well be moved to a favourable position. For general use you should employ a stop of about one-fourth the area (½ diameter) of the largest. 2. Probably it is not kept in stock in this country, but perhaps Marion, of 22, Soho Square, could obtain it.

H. BAKER.—Thank you for the portraits, which we shall value; they are excellent.

CAMBRIAN.—1. As a rule, not so firm; and there are other minor disadvantages. 2. Considering everything, we recommend No. 3, and it will enable you to work with one element of a doublet—this being often a considerable advantage.

GREENWOOD PIM.—Please send particulars at your earliest convenience.

S. J. L.—An objective of the rapid rectilinear or symmetrical type, focus about fifteen inches.

A. ENNOSOR.—Chromate of lead has been used, and has become darkened and discoloured by the action of light.

T. JOHNSON.—Such an arrangement is very convenient, but whether it is better than that referred to last week is determined by special circumstances and requirements.

A. J. MERCER.—It is very neat, and likely to be useful. Perhaps you will explain the construction, and tell us how you set the hand to zero.

H. C. BRAUN.—Regarding most of the points, you will obtain information in a series of articles on the Woodburytype process, which appeared in our volume for 1881, pages 177, 210, 223, 276. In order to make the tin-foil adhere to the mould, it is sufficient to coat the latter with thin india-rubber solution, to allow it to dry, and then to pass it, along with a sheet of tin-foil, between the rubber rollers of the usual wringing machine.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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THE ROYAL ACADEMY.

If there are less glaringly bad pictures at the Academy this year, there are also less prominently good ones. The exhibition reaches a very respectable standard, but does not extort enthusiasm. In coming to this conclusion we have excluded the portraits from consideration, because we propose to treat them separately

It is to some extent the truth that from a good many of the Academicians, who have made a name and fame, one knows exactly what to expect. Thus Edward Long for years has been painting Eastern beauties with oval faces and dusky skins, and in his "Love Feast" (No. 3) he has simply repeated the types he has drawn so many times before. Nor is it easy to understand why he, like many other artists, selects subjects which require you to read a book before the subject is intelligible. When Mr. Long tells you to "see Fabiola," by the late Cardinal Wiseman," it is impossible to get up more than a languid interest in his work. Mr. Long, indeed, seems just now to be much afflicted with cardinals, for to discover what "Callista, the Image Maker," is about, you have to "see Callista, by Cardinal Newman." In addition, he has painted a portrait of Cardinal Manning.

C. W. Wyllie is a painter from whom we always expect something worth looking at, and he fully sustains his reputation in "Past the Old Town" (No. 8), and in "Saturday Afternoon, East London" (No. 351). The first-named shows a couple of Grand Junction Canal barges coming round the bend of a river, leaving behind them the old town, with its church and cluster of quaint, red-roofed houses, just veiled by a slight haze. The most notable picture in Gallery 1, and, in some respects, in the whole exhibition, is Sir John Millais' "The Nest." Millais has often been charged with wasting much of his genius upon what has been termed "baby pictures," but for all that, we would rather have one painting like "The Nest," than a host of such pictures as "Mercy" (No. 298). The painting of the eyes of the child lifted up to look at the nest in the hedge is nothing short of marvellous, while the tenderness of expression in the woman's face, though only the profile is shown, is beyond praise. "Mercy" represents a Catholic nobleman with drawn sword, about to issue forth to take his share in the massacre of St. Bartholomew's day. A nun is kneeling at his feet endeavouring to dissuade him, a fanatical young priest is standing at the door beckoning him on. Somehow the effect of the picture is theatrical, and one thinks of the costumier instead of the Huguenots.

Colin Hunter, it is gratifying to see, is making an effort to get rid of the mannerism which has marred so much of his later work. "Their Share of the Toil" (No. 28) has much freshness, and although the sea has been ruled in lines in the approved Colin Hunter fashion, it has a look of nature about it. The pictures of Italian life by Henry Woods, and of Spanish life by J. B. Burgess, come under the category of things you expect to see, but there is this to be said, they are always worth seeing. "Under the Vine" (No. 47), of the first-named, is a charming study of Italian peasant girls, and Mr. Burgess's "Making Cigarettes at Seville" (No. 140) is as clever as anything he has done, the variety of pose and the varying expressions of the dark-eyed, merry-faced girls being well worthy of study.

Briton Riviere's "An Old World Wanderer" (No 76) is one of those pictures you feel you ought to admire, because it is an attempt at the unconventional. The admiration, however, does not come forth spontaneously. A rocky coast, a vast crowd of sea-birds with a semi-naked man in the midst, and behind, the ship of the period, from which the man has just landed—it is not quite clear whether his scanty clothing is wet, although he must have swum ashore—make up the picture. Mr. Riviere has applied the theory—to be feared only a theory—that the animals of a country into which man has never penetrated are perfectly tame, consequently the sea-birds look at the intruder with curiosity, and do not attempt to fly away. Mr. Riviere's small picture "Jilted" (No. 253) is much to be preferred to this ambitious effort. It is simply a young fellow crushing in his hand the letter which has told him his fate, while a dog, which knows something is amiss, is keenly anxious to show its sympathy.

G. A. Storey's "The Young Prodigal" invites comparison with Augustus Egg's famous picture of the foolish young fellow who has given a dinner to two merry damsels, and is unable to pay the bill. Mr. Storey's materials are more ample, but the idea is much the same. "The Smelt Net" (No. 96) of C. Napier Hemy is one of those pictures of deep green sea in which this artist delights. It is exceedingly good, but very like what Mr. Hemy has done many times before. The veteran Sydney Cooper gives us a recollection of London in "Early from Old Smithfield Market" (No. 110); but it is impossible to believe that either the cattle or the market at that period ever looked so painfully clean as Mr. Cooper has represented. In this room (Gallery 2) is one of the most delightful landscapes in the Exhibition—Alfred Hunt's "On the Dangerous Edge." The distance, seen from the cliff on which the spectator is supposed to be standing, is beautifully rendered.

"Mariamne," by J. W. Waterhouse (No. 134), is an imposing and, in some respects, a grand picture. Mariamne, as she passes her husband on her way to execution, turns on him a look of reproachful indignation. Herod has bowed his head, and dares not face his injured wife. The figure of Mariamne is magnificently drawn, and Mr. Waterhouse has quite risen to the dignity of his subject.

Sir F. Leighton's "The Jealousy of Simætha, the

Sorceress," is a fine study of the head of Miss Dorothy Dene, somewhat over accentuated. His most important work is "The Last Watch of Hero" (No. 229), with a pendant in monochrome.

It is not necessary to read the long catalogue extract from Mrs. Jameson's "Sacred and Legendary Art" to understand the meaning of W. F. Yeames' picture of St. Christopher, a striking production, in which the face of the bearer recalls Albert Durer's best work, and in which the Holy Child is more human than in the much idealised pictures of the Raphaelite period.

H. T. Wells' picture of "The Queen and her Judges" may be described as certainly excellent portraits of the gentlemen of the Guard. Her Majesty is a little less like herself than usual, which is saying a good deal. Sir William Harcourt in his Court dress looks half like a burly policeman, and half like an elephantine page-boy. Mr. Wells' other picture of the Queen "At Kensington Palace in the Early Morning of June 20th, 1837," is much more meritorious. The light of dawn just stealing into the room is admirably conveyed.

H. W. B. Davis and B. W. Leader are always the same, the first revelling in the tender light of evening, and the second arranging his trees, his church, and his sky to his own pattern. Thomas Faed has given up pathos for humour in his "No Rose without a Thorn" (No. 239). A very determined-looking Scotch dame is escorting home her husband, who is rather overcome. It is not quite clear which is the rose and which is the thorn. Nothing more perfect in the way of still life can be found than H. Fantin's "Grapes" (No. 262); it is delightful in every way. H. S. Marks is not quite so happy as usual in his picture of puffins which he styles "Dominicans in Feathers," nor can J. C. Hook be complimented on his "Fresh from the Waves"—at least, so far as the drawing of the woman is concerned. W. J. Orchardson shows all his old skill in dealing with a vast Salon of the First Empire period. The two figures, a lady and gentleman, are in evening dress, and had not the title been "The First Cloud," it would have been easy to see from the expression of the gentleman's face, and from the haughty carriage of the lady who is sailing out of the room, and whose face cannot be seen, that the two had had a "difference." It is a wonderfully clever picture, and, like all Mr. Orchardson's work, needs no legend underneath to tell one what it is about.

Alma-Tadema's "The Women of Amphissa" (No. 305) will, of course, be one of the pictures of the year, but he has been happier, both in choice of subject and in treatment. Albert Goodwin is an artist who imbues nature with colours of his own choosing. His "Shipwork: Sindbad the Sailor Storing his Raft," can only be described as an eccentricity. A very impressive work is the "Misery and Mercy" (No. 338) of Frederick Goodall. It represents Christ, and the woman taken in adultery. The contrast between the pity and dignity of Christ, and the contrition of the woman, is admirably shown. The surroundings being bare and vacant, give the picture, when looked on from near, a coldness which detracts somewhat from its interest; but when seen from the distance and through the vista of rooms the case is different. Frank Bramly's "Eyes and No Eyes" (No. 350) is a delightful piece of humour. The laughing faces of the girls are irresistible.

Charles P. Sainton's "The Rag-picker's Home in Paris" (No. 369) is a careful study in the low tones of the Continental schools, the finest example of which in the exhibition is "Their Ever-shifting Home" (No. 543), of Stanhope A. Forbes. As a contrast to the gaudiness of the average English picture this is worthy of all praise. The painting of both of the tramps and of the landscape is masterly. John Brett's pictures of multitudinous hues and prettinesses may be passed over; they belong to a byegone age. John O'Connor's "Ludgate," photographers will note, has been squeezed together, and the dome of St. Paul's made a hundred feet higher or so, in order that the painter might get the effect he wanted. This kind of thing is dangerous to attempt in a London subject. Photography has made the metropolis its own. It is very certain that but for photography, Mr. Logsdail's "The Bank" (723) and "St. Paul's" 846) would never have been painted. If the painter has not studied the instantaneous photographs of these well-known spots in regard to the foot and vehicular traffic, it will be very surprising.

Other painters besides Mr. Faed seem disposed to attempt new grooves. F. Barnard, hitherto known as a humourist delighting in the early Victorian costume, has painted a Corin and Touchstone, accompanied by some very comical sheep. Herbert Schmalz, too, has forsaken his pretty, solitary, somewhat sad young ladies, and goes in for more ambitious work. We have pretty well had enough of Napoleon as a subject for the brush, and Ernest Croft's picture of the Emperor leaving Moscow needs no comment save that it suggests the speculation how the Old Guard managed to keep their uniforms so spotless and immaculate during one of the worst campaigns known in history. Of military pictures, Andrew C. Gow's "The Garrison marching out with the Honours of War, Lille, 1708" (No. 504), is decidedly the best. The look of hunger in the starved soldiers' faces, dauntless and determined as they still are, has been most truthfully conveyed. It is one of the most touching pictures in the exhibition.

Henry Moore has excelled himself in "The Clearness after Rain" (No. 659). It is the veritable sea itself, and the more one looks at it the more one marvels at the painter's technique. E. J. Gregory is also happier than usual in "Marooned" (No. 839), one of his favourite modern idyls of river scenery. The painting of the canoe and the fair occupant is very charming. Among the pictures deserving of mention, but which we must content ourselves with enumerating, are Harry P. H. Friswell's "A Day in Early Summer" (No. 1027), W. L. Wyllie's "King Coal" (No. 1046), James Hayllar's "The Honoured Guest" (No. 491), R. W. Allan's "The Haven under the Hill" (No. 903), Blair Leighton's "A Literary Lover" (No. 885), W. H. Trood's "Feel Better Now" (No. 740), Herbert Gandy's "Rescue" (No. 714), and E. H. Fahey's "On the Bure, Suffolk" (No. 522).

Toft's bust of the President of the Photographic Society occupies a prominent place in the sculpture room, and it is remarkably well lighted; indeed it looks better than when we previously saw it. This artist also exhibits an excellent terra-cotta bust of George Wallace.

A NEW DARK-SLIDE.

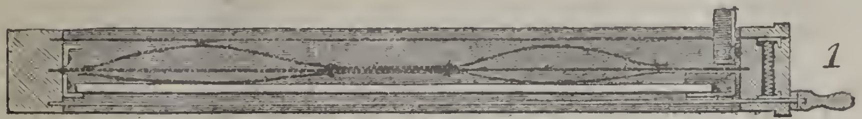
At a recent meeting of the Society of Amateur Photographers of New York, the President, F. C. Beach—now past President—exhibited and explained a dark-slide, which is the invention of M. P. Warner, of Holyoke, Mass. We give the description as furnished by Mr. Beach, and illustrated by a cut reproduced from the *Scientific American*.

Fig. 1 represents a longitudinal section, in which the upper slide is withdrawn. The body of the holder consists of a light hard wood frame, having a metal septum or division in the centre, upon each side of which are riveted very light flat steel springs, shown clearly in Fig. 2. In the lower half of the holder (Fig. 1) may be seen a plate in position. An angular metal strip is rigidly secured on the left-hand end of the inside of each plate compartment, intended to hold one end of the sensitive plate, while at the opposite end is a movable or pivoted angle strip or clamp provided with projecting ends, which, when thrown up, permits the sensitive plate to freely drop down into the holder, resting, as it were, upon a bed of springs.

To insert the plate, the holder is held with its narrow end resting on a support at a slight angle, then the exposing slide is withdrawn, and the plate, film side out toward the operator, is slid over the spring under the left hand angular strip. In this position the other free end of the plate projects slightly above the holder. The right hand clamp is now turned down over the end of the plate, pressing the same down into position. The springs compensate for any variability in the thickness of the glass. Hence the film side of the plate remains always in the same plane and in focus. The exposing slide is next inserted, and the holder is filled ready for use.

Special cut-off light valves, consisting of plates with one side bent down, forming an angle to prevent slipping, and also arranged to fly outward by a miniature spiral spring between them, as the slide is withdrawn, and effectually close the slit, may be seen in Figs. 1 and 4.

In removing the sensitive plate, the pivoted clamp is first turned up. At once the springs underneath force one end of the plate up and out of the holder, when it is easily caught with the fingers and slipped out. This feature of the holder is quite important, since in ordinary holders the operator is obliged in many cases to dig out, as it were, the plates with the fingers, being very apt to injure or scratch portions of the film. Fig. 3 is an enlarged view of the rigid angular strip. Fig. 4 shows the pivoted clamps down, when holding the plates. The dotted line indicates the position when thrown up.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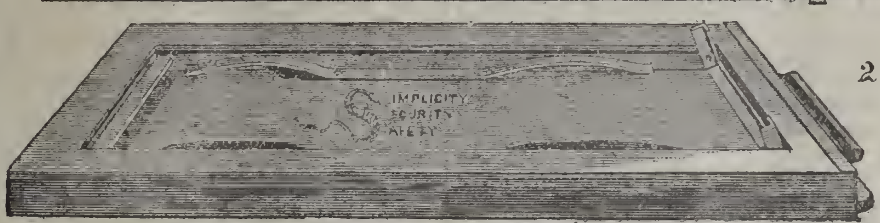

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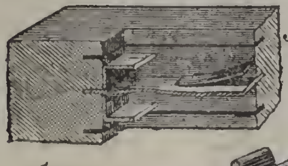
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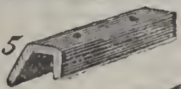
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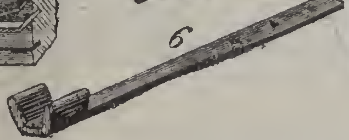
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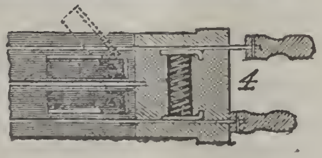
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Fig. 5 represents another form of a rigid angular strip, intended to be substituted for that shown in Fig. 3, with the bevel side downwards, and in conjunction with two spring clamps, bent in the shape of a half-bow, secured to the inside end of the holder in place of the pivoted clamp. With this latter device the plate is inserted by dropping it into the metal bevelled strips and pulling back, with two fingers, the spring-forked strips. When these are released they fly forward, and they securely grasp the plate. To remove the latter, the forked strips are pressed back, allowing the plate to be lifted out. Pivotted flat pieces of brass on the inside of the holder (not shown) are arranged to hold the spring forks back while the plate is put in or taken out. The bevel shape of the stationary clamp is intended to accommodate different thicknesses of glass. The holder, being made in one piece, is perfectly tight, while the arrangement of the clamps permits uneven and rough-edged plates to be quickly and easily inserted.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter VII. — Albumen—Asphalte—Cellulose—Alcohol—Ether—Tannic, Gallic, and Pyrogallic Acids—What is Light?—Shadows—Pin-hole Photography—Intensity of Illumination in General.

Albumen is, like gelatine, extensively employed in photography as a medium for sensitive salts. It is preferably obtained from the whites of eggs, which contain about 12 per cent.; for though blood is a cheaper material and contains some 7 per cent., its albumen is not so readily got in an equally pure condition. Albumen from different sources does not appear to have exactly the same properties. It contains about 1½ per cent. of sulphur, which is readily changed into sulphuretted hydrogen by putrefaction, or by a few minutes' boiling with a weak caustic alkali. Albumen differs entirely from gelatine in being precipitated or made insoluble (coagulated) by heating its solution to a little above 60° C., by the action of dilute acids, or of a solution of nitrate of silver. It is insoluble in alcohol, and weak alcohol added to its solution in water precipitates soluble albumen, while strong alcohol throws down the coagulated variety. It is not possible to detect any difference in composition between soluble and coagulated albumen, but when coagulation is determined by certain substances, as nitrate of silver, the product is a compound of albumen with the reagent used. White of egg is not a pure solution of albumen; it contains, among other things, a little alkali, which is necessary to make it readily soluble in water. Pure albumen may be prepared by adding sub-acetate of lead to the ordinary albumen solution, and so obtaining it as an insoluble compound with the salt, which may be purified by washing. The lead is removed by means of carbonic acid, followed by sulphuretted hydrogen.

Albumen, when dry, forms a pale yellowish mass which is easily powdered; it swells up in water like gelatine, but dissolves with difficulty unless a little alkali is added. Dry albumen may be heated to 100° C. without coagulation. Coagulated albumen dries to a translucent, brittle yellow mass, which will absorb about five times its weight of water.

Asphalte, or mineral pitch, is also called Jew's pitch, or bitumen of Judea, because it is found upon the shores of the Dead Sea. It is, in general, soluble in fats and oils (Niepce is stated to have used oil of lavender and benezne in experiments), and also in solutions of alkalies and alkaline carbonates. By extracting asphalte successively with alcohol, ether, and chloroform, the parts dissolved vary considerably. The first is yellow, oily, strong-smelling, and very little, if at all, sensitive to light; the second is brownish black, brittle, nearly odourless, and sensitive; and the chloroform extract yields a residue that is black, brittle, odourless, most sensitive to light, and contains more sulphur than the others.

Cellulose constitutes the framework of plants. Elder pith, cotton, linen, hemp, unsized white paper, are very nearly pure cellulose, and may be further purified by successive and repeated treatment with dilute alkalies, dilute acids, alcohol, ether, &c., for cellulose is not affected by any of the more usual solvents. Cellulose is remarkably stable when pure, but readily decays when in contact with other decomposable substances, as in rotting vegetable matter. Strong sulphuric acid dissolves cellulose and changes it into a sugar. But if the strong acid is mixed with a half to a quarter of its bulk of water, a few seconds immersion in it of unsized paper, followed by washing in weak ammonia, gives what is called parchment paper. Strong nitric acid, especially when mixed with sulphuric acid, gives the nitrates of cellulose that constitute pyroxlin or gun-cotton, but in the preparation of these compounds for collodion, the sulphuric acid, doubtless, acts in other ways than merely as an aid to the nitric acid. The manufacture of collodion will be subsequently considered. Even strong hydrochloric acid does not affect cellulose, but chlorine, in the presence of water, destroys it: hence the bleaching of paper, or the materials from which it is to be manufactured, demands great care, and it is necessary to neutralise the chlorine that remains with an "antichlor." The commonest antichlor is hyposulphite of sodium, because it is the cheapest and most efficient of the available compounds, but its use should be avoided in making paper for photographic purposes. Cellulose is soluble in an ammoniacal solution of oxide of copper.

Concerning alcohol (C_2H_5OH) it is only necessary to explain a few common terms. "Absolute" alcohol contains not more than one or two per cent. of water. "Proof spirit" contains approximately half its weight of water. "Methylated spirit" contains at least four or five per cent. of water, and ten per cent. of crude wood spirit added to make the alcohol nasty enough to be practically useless for the preparation of beverages. Methylated spirit is free from duty, and it is illegal to purify it.

Ether $[(C_2H_5)O_2]$ is exceedingly volatile; its vapour is heavy and easily inflammable. It is dangerous to use ether, or liquids that contain it, in an apartment that has a naked flame in it without great care, and in small dark-rooms, tents, &c., a bottle containing ether should never be opened. What is called "methylated ether" has been prepared from methylated spirits, and is good enough for all purposes except the preparation of collodion that is to be the medium of a sensitive salt.

Tannic, gallic, and pyrogallic acids are simply related to one another. The active constituent of tanning materials (gall-nut, &c.) appears to be digallic acid ($C_{14}H_{10}O_9$) combined with glucose. By boiling it with dilute acids the glucose is separated, and the digallic acid takes up water, becoming gallic acid [$C_6H_2(OH)_3COOH$]; thus :—

$$C_{14}H_{10}O_9+H_2O=2C_6H_2(OH)_3COOH$$

when gallic acid is heated it volatilizes, and the crystalline substance that condenses, which Scheele considered to be unchanged gallic acid, is what we know as pyrogallic acid [$C_6H_3(OH)_3$.] By the heating the gallic acid loses carbonic anhydride thus :—

$$C_6H_2(OH)_3CO.OH=C_6H_3(OH)_3+CO_2$$

It is not necessary to prepare gallic acid first, as the dried aqueous extract of gall nuts gives pyrogallic acid when it is heated. If gallic acid is dissolved in glycerin, and the solution is heated to a temperature of 185° to 200°C., pyrogallic acid is produced, with effervescence due to the escape of carbonic anhydride, and if glycerin is desired in the developer, this method may be useful on account of its cheapness. Pyrogallic acid does not possess those characteristic properties that chemists understand as invariably associated with acids, and hence it is sometimes called "pyrogallol." Pyrogallic acid is a more powerful reducer or developer than gallic acid; it reduces silver nitrate in solution immediately unless its action is retarded, as by the addition of acetic acid.

It will be convenient next to discuss a few preliminary matters in connection with optics, before passing to the consideration of practical photography.

We do not know what light is. The most useful theory regards it as the undulatory movements of a something whose particles oscillate in paths approximately at right angles to the direction of propagation of the wave; but no research appears to have got at the something that moves in this way. It has been named before it is born—the "luminiferous ether." Although the nature of light is a matter of conjecture, we know in many cases what its effects are, and how to control those effects. We know that light travels from a luminous object, and the rate of its movement can be experimentally demonstrated, though the time occupied in passing over terrestrial distances is so small as to be inappreciable except by means of specially made apparatus.

Light travels through homogeneous media in straight lines, and, therefore, any opaque substance introduced into the path of light that emanates from a point produces a sharply-defined shadow. But it is practically impossible to get a luminous geometric point; and as all sources of illumination (except an individual star) have a sensible magnitude, they cannot give a sharp shadow. In figure 1, *d* marks the limits of the true shadow, but the full light falls upon the screen only beyond *e*. The space from *d* to *e* shows a perfect gradation from darkness to full light, and is technically called the "penumbra." The extent and richness of gradation of the half-lights in photographic pictures is entirely controlled by the size and position of the surface that illuminates the object photographed, or, when more than one illuminant is employed, their relative sizes, positions, and intensities.

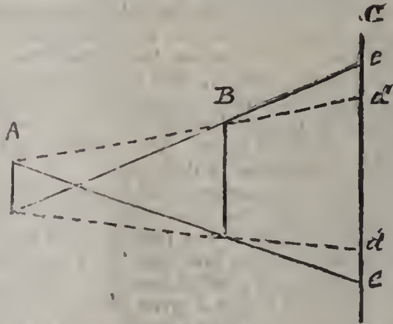

Fig. 1.—A, Luminous surface; B, opaque object; C, screen upon which the shadow is cast.

If a point of light shines through a hole upon a screen, the patch of screen that is illuminated will be of the same shape as the hole, but larger. The continuous lines in figure 2 illustrate this. If the distance of the light from the hole is many times the distance of the hole from the screen, the increase in size will be inappreciable, and may be practically neglected. Any number of shining points will act in the same way, and each quite independently of any other, as shown by the broken and dotted lines in fig. 2. Now as everything whatever that can be photographed may be regarded as an infinite number of luminous points, some groups of points shining very feebly, and others more strongly, according to the brightness of the different parts of the subject, it is possible to get an image with a simple hole and a screen. As the hole must be small it is technically called a "pin-hole," and as pin-hole photography has such great advantages, we might be tempted to think that if sufficiently sensitive plates were available, the use of lenses, with the numerous troubles they introduce, would be very much restricted; but a complete survey of the question reveals the error of such a notion. Though the pin-hole gives an absolute "depth of definition," and no distortion, except that due to the projection of the image on a flat plate, it is impossible for it to give sharp definition.

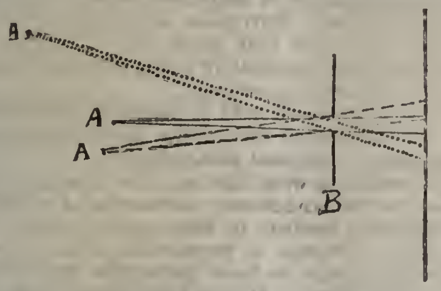

Fig. 2.—A, A, A, Shining points; B, perforated screen.

To represent what ought to be a mathematical point by a round patch one-hundredth of an inch in diameter is generally considered as the minimum of sharpness in definition that is permissible in the more usual sizes of photographs. Now a pinhole of this character would scarcely give a workable amount of light even for bright subjects. The sharpness of definition is inversely proportional to the diameter of the hole, while the intensity of illumination is proportional to its area, or the square of its diameter; so that, for example, to double the sharpness of definition, the diameter of the hole must be halved, and by so doing the intensity of the illumination is reduced to one-quarter. But as the hole is made smaller the phenomena of diffraction become more marked, that is, the bending of light round the edge of the hole, or more strictly, the behaviour of the light as it passes through the hole, as if the hole itself were a source of light. This is obviously directly antagonistic to sharpness of definition.

Pinhole pictures are always small, because the diminution of light intensity with the same hole is proportional to the square of the diameter of the picture, or to the square of the distance between the hole and the screen upon which the picture is projected; which means, to take an example, that if it is required to get a given picture 10 by 8 instead of 5 by 4, the sensitive plate must be twice as far from the hole, and the exposure must be four times as long.

The intensity of illumination in general, besides being proportional to the area of the opening through which the light is admitted, is also dependent upon the angle that the pencil of rays makes with the illuminated surface. In figure 3 the horizontal lines stand for a pencil of rays, and it is obvious that the screen indicated by the perpendicular line receives this pencil upon a smaller surface than an oblique screen placed in the direction of the dotted line. The intensity of illumination is inversely proportional to the extent of surface over which the light is spread; or it diminishes with the obliquity of the pencil in proportion with the cosine of the angle which the incident ray makes with the normal to the surface. This principle comes into action when the swing back of a camera is used, though so slightly as to be practically negligible. It is in photographic printing where much time may be lost through not placing the frames "square" to the source of light; and the loss in this case is aggravated by the reflection from the glass, which rapidly increases with the obliquity of the incident pencil.

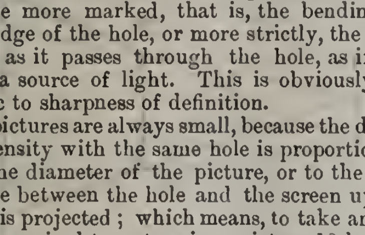

Fig. 3.

(*To be continued.*)

Review.

Cyclists' Touring Club Hand-Book and Guide. British and Irish edition. Limp cloth, with edges turned in. One shilling. (*London: Ernest R. Shipton,* 139 *and* 140, *Fleet Street, E.C.*)

Cyclists in general are so appreciative of the usefulness of Shipton's Hand-book, as to look with expectation for its appearance in the spring.

Besides being a directory to the extensive and useful arrangements made by the Cyclists' Touring Club for the benefit of their members, it may be regarded as by far the most handy and convenient general book of reference relating to cycling matters; and, moreover, it is so light that, despite of its cloth binding and 200 pages, it only weighs five ounces—in fact, just about the same as one of the stiff-backed suburban maps ordinarily sold at the railway stations. In spite of this lightness, all is clear and legible, the paper being hard, thin, and opaque, while the printing is first class.

The map of the British Isles is worth all the money; then we have the constantly-growing list of hotels where arrangements have been made as to charges, those providing dark-rooms or cupboards being noted; and among other useful points may be mentioned a table of weather signs and forecasts, county and borough bye-laws, railway and steamer charges, warehousing and stabling, and a couple of ribbon place-markers.

Year by year Shipton adds to the obligation cyclists are under to him for the production of his excellent handbook.

TESTING LENSES.

BY CHAPMAN JONES.

Spherical aberration is caused by the edges of lenses refracting more strongly than the centre, and thus giving a different focal point. This confusion makes the image ill-defined and never "in focus," and is cured by using a stop; the stop separates the effects of the different parts of the lens, and the smaller the stop the more complete is the separation. To test for spherical aberration, therefore, use the largest aperture that the lens is supposed to work with, and examine the image formed on the ground-glass for sharpness. To be more exact, turn back the focussing screen and examine the image direct with a magnifying glass.

The coincidence of the visual and actinic foci should also be determined by using the full aperture. Mark the newspaper or its equivalent, arranged as above described, across the middle, and arrange it slopingwise with its top part a few inches further from the camera, and its lower part a few inches nearer. Very carefully focus the middle line, expose a plate, develop it, and when dry examine it under a low microscopic power (say a one-inch objective) to see if the middle line is the middle of the sharpest part of the negative. If the middle of the sharpest part is above the middle line, the actinic focus is within the visual focus; if below, it is without. This test supposes that the focussing screen and the surface of the sensitive plate are in exact register. To eliminate any error in the camera, coat a clean glass plate with very dilute negative varnish, and scratch a coarse network of fine lines upon it. Put the open dark slide in the camera, and hold this plate in position while you focus with an eyepiece. The image and the lines on the front of the plate must be both perfectly sharp at the same time. Now put the sensitive plate in the same side of the dark slide that the temporary screen occupied, for exposure.

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* Continued from page 267.

To test for distortion of the image, bring the image of any convenient straight line, such as a window frame, close to the edge of the focussing screen, and observe how far the middle of the line is bowed outwards. This refers to single lenses; symmetrical doublets would give a scarcely recognisable amount of distortion even if carelessly made.

There are many methods given for ascertaining the equivalent focal length of a combination of lenses, but perhaps the simplest consists in focussing an object so that its image is the same size—a piece of white writing paper is convenient—and measuring the distance between the object and the front surface of the focussing screen. One-quarter this distance is the focal length sought.

For maximum rapidity divide the diameter of the full aperture into the focal length. Tables concerning this and allied matters are so numerous and well-known that there is no need to enlarge upon the subject here. It is sufficent to say that it is convenient to use a small pair of compasses with needle points to get the diameter of the stop, and to apply the compasses to a scale divided into fiftieths or hundredths of an inch.

Given the same rapidity and focal length, two very important points of comparison are the covering power and flatness of field. For covering power, adjust the lens to a camera with a larger focussing screen than the lens is made to cover, and see how far from the centre of the screen, on both sides, you can bring the image of some suitable object that is as far away as convenient, without losing the power to focus an intelligible representation of it. The face of a watch is a good object to use.

At the same time astigmatism may be looked for. This fault, practically expressed, is the impossibility to get a vertical and a horizontal line into focus at the same time If present at all, it shows especially towards the edge of the field. If the thick strokes of the watch face are too heavy, compare the fine strokes of the X's in the figures twelve and nine.

Flatness of field may be compared by using the newspaper arranged as described above. The lens should have its full aperture, and the centre of the object should be exactly focussed. The position of the focussing screen is marked on a piece of paper gummed to the base-board of the camera, and the image that falls upon the edge of the screen is focussed as exactly as possible. The distance between the two positions of the focussing screen gives an indication of the curvature of the field.

There are, perhaps, no other tests which the photographer, as such, can profitably apply to lenses that he wishes to compare. "Depth of focus," as it is called, is not so much a question of the quality of the lens, as of the aperture and focal length. An inferior lens may show apparently a greater depth of focus, chiefly because it is inferior, and, giving no sharp image at all, is not better at defining things a little out of focus, but unable to define those that ought to be in focus.

In conclusion, it must be always borne in mind that not one of the tests described above will give a result of the slightest practical value unless it is applied carefully by one who is accustomed to make scientific observations. The methods given are not suggested as the best, but as probably the most convenient to a photographer. The optician has methods that are handier to him, and he has other tests to make if he would ensure the quality of his work. But the photographer is not often an optician.

It may not be necessary to look at a lens from all the points enumerated, to form a fairly certain judgment of its quality. Mr. William Ackland stated, many years ago, that he had professionally sorted out a number of first-class instruments from the mixed importations of French portrait lenses, by examining their centring, their covering power, and their achromatism. He further adds that those he selected were charged at a considerably higher price, and that he did not know of a single case in which the selected lenses failed to give satisfaction.

CARD-MOUNTED FLEXIBLE GLASS FILMS.

BY A. PUMPHREY.[*]

On a previous occasion I had the pleasure of drawing the attention of our members to my flexible glass films, and I then pointed out the importance which, from the earliest practice of the photographic art, had been placed on the medium carrying the negative, as affecting the results.

A matter of not less importance in these days of haste and impatience is the production of a negative which will print quickly, and be equally suitable for the production of either paper or glass positives, or for enlargements; these conditions are more perfectly obtained on my flexible glass films than on any semi-transparent medium.

The drawback to the use of these films has been that they were not quite ready for use, also that they were much more costly than glass. I now send them out quite ready for use, by attaching them to cards strong enough to hold the film in the camera flat and true. When it is desired to develop the latent picture, the film is drawn from the card and placed in the developing dish and treated in all respects as if it were a plate. Recent improvements have made the supporting medium free from any tendency to curl or twist in the developing or fixing processes.

The only other point requiring attention in the working of these films is the method of drying, which has always been the weak point with films. The plan which I now give has been well proved, and is in all respects satisfactory, and produces a negative as flat and true as a glass plate. It consists simply in pasting the negative upon a stiff cardboard to dry; the card allows the plate to dry from the back; the film itself being impervious to moisture, cannot be dried upon glass. The varnish is applied when the film is dry, and before it is removed from the card.

Directions for Drying.—When the negative is washed it is placed face downwards, all moisture is removed from the back, and it is then placed on a piece of thick cardboard which has been evenly but not thickly brushed over with paste, and the negative is well rubbed down to exclude bubbles; this may be done either with the hand, or a piece of paper may be laid upon it and rubbed. It is then allowed to dry, which will take ten or twelve hours. The paste is made by mixing one ounce of flour with six ounces of cold water until perfectly smooth, then boil it, and use when cold.

Varnishing.—This is an important point, and should not be omitted, as it prevents the film curling by the gelatine surface absorbing moisture. When the surface of the film is quite dry, apply the special varnish (cold) with a soft brush; it will dry in two or three hours. The brush should be kept soft by being placed in spirits of wine when not in use.

W. K. BURTON IN NEW YORK.

It may be of interest to many at home to learn of Mr. Burton's safe arrival here on the 16th, and of his efforts at sight-seeing. He has met with a very warm reception by both amateurs and professional photographers, who are not only pleased, but surprised, to find in him a man of youthful and vigorous appearance, quite practical and American in his manner. He had the pleasure of spending an evening at the New York Society Club Rooms, and was agreeably surprised at the large size of the premises, and the various kinds of expensive apparatus kept there for the use of members. It was all on a larger and more business-like scale than he had anticipated. He was entertained with a short exhibition of lantern slides, and found several of the same were of a superior quality.

On Thursday evening, the 21st, prior to his departure for San Francisco, upon the invitation of the new and genial President (Dexter H. Walker), a few members of the Society and their friends, together with the officers, complimented Mr. Burton with an informal dinner at the St. Dennis Hotel, corner of 11th Street and Broadway. Everyone was in the best of spirits, and as a result the evening passed very pleasantly and profitably to all concerned. Unfortunately, President Walker was unable to preside because of a sudden illness, and Dr. John H. Janeway, our ex-Vice-President, was prevented from attending in consequence of a previous engagement elsewhere.

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[*] Read before the Birmingham Photographic Society.

Vice-President George W. Allerton presided, and Recording Secretary Daniel P. Read assisted at the opposite end of the table. Among the others present were W. J. Lincoln Adams, of the *Photographic Times*, Arthur H. Elliott, of *Anthony's Bulletin*, George H. Ripley, William M. Frisbie, Thomas T. Eckhert, Jr., and F. C. Beach.

Several toasts were offered. Mr. Allerton and Mr. Read both heartily welcomed Mr. Burton, extending to him the good wishes of the Society. Mr. Ripley spoke of having been first interested in photography through a small item written by Mr. Burton, published in the *Photographic Times*. He commended Mr. Burton's writings, was always interested in reading what he had to say, and invariably evolved from them some fact of practical value. Mr. Beach alluded also to the interest he had always had in whatever Mr. Burton wrote about, and it was the common sense, useful character of what he said, applicable to the understanding of those looking at photography from a practical standpoint, that undoubtedly made his articles so interesting. He remarked that Mr. Burton was a member of the London Camera Club, so closely affiliated to our New York Society, and on that account he wished him a very hearty welcome, assuring him that he would have the best wishes of the Society in his journey across the Continent, and to the final end of his trip to Japan. He was going from a highly civilized to a comparatively uncivilized nation, where he would no doubt exert an influence for good. A toast of the "Photographic Press" was then ably responded to by Dr. Elliott and Mr. W. J. Lincoln Adams. Dr. Elliott entertained the same opinion of Mr. Burton's writings as the previous speaker; he wrote in such a way that we always liked to read it, but it was a greater pleasure to see the man and make his acquaintance.

Mr. Adams remarked that he, perhaps, had seen more of Mr. Burton than any of the others, and found in him a very genial gentleman, quite unexpectedly American in his ideas and manner. Having become personally acquainted with the author of so many articles on photographic subjects, he should read his future writings with much greater interest. He wished him a pleasant journey, and knew that all present hoped his undertaking would be successful.

After so many pleasant words, Mr. Burton felt that he was called upon to reply. He could only give his sincere thanks to all for the very cordial and generous manner in which he had been treated. Everywhere he went he found American photographers very willing to assist him and give information. In this respect he thought they differed somewhat from the English photographer, who, as a rule, was quite jealous of what he knew, and endeavoured to create the impression that his knowledge was superior to anyone else's. Because of this feeling he was afraid an American photographer going to England would be coolly received. He was sorry to have to confess it, but believed it would probably be the case in view of his agreeable reception here. He was struck with the small number of societies and clubs in New York. They are so plentiful in London as to enable one to attend a photographic meeting nearly every night in the week. There was in London, in the majority of clubs, a remarkable assimilation between the amateur and professional photographer, as well as of dealers and manufacturers of photographic materials. All were placed on an equal footing, and never stopped to inquire what was the nature of their business or standing.

The Camera Club, in which he was interested, was the largest, and was intended only for amateur photographers. They had a dark room for the use of members, but all the other portions of the premises were devoted to the club purposes, having convenient chairs, lounges, &c., where one could have a pleasant chat, smoke, &c.

The London and Provincial Society, he thought, was the most progressive and American in its ideas. They frequently had lively discussions and jolly times. The Parent Society, he said, was quite stiff and formal. A paper was read, a few remarks made, and the meeting adjourned. While professionally he was a sanitary engineer, yet he had a peculiar fondness for photography, and he could only say about himself that he loved to write about it, and was glad to hear his articles were appreciated here. He desired to specially thank the firm who had so kindly interested themselves in his behalf while here, and closed with expressions of goodwill to all present.

It was unanimously resolved that he be proposed as an honorary member of the New York Society at its next meeting. The entertainment closed at a late hour. It will, no doubt, form a pleasant remembrance to Mr. Burton when he reaches the sunny climes of Japan. All wished him God-speed and a safe journey.

RETOUCHING.

BY M. JOSTI.*

Retouching, like other subjects, has a history, although the record does not extend very far back, and in its career has had to contend with varied opinions as to its utility from an art point of view; it has, however, held its place and become an important branch of photography. As a matter of fact trading photographers cannot get along without it.

Scientific photographers were its most determined enemies, and strongly objected to the original work of the camera being tampered with; there were many reasons *pro* and *con*, and I have frequently received strong censure for defending this help to artistic photography. The strongest argument against retouching is that the human eye cannot reach what the eye of the camera can, and that our hand is unable to help the precision of the lens. We must give in to this to a certain extent; but I maintain retouching is a valuable auxiliary.

When retouching first took root there sprang into existence a multitude of individuals of very little artistic knowledge, but who embraced a clean and easy method of attaining a living, and thus heavily handicapped the scientific retoucher. To aid me in making my lecture as complete as possible, I endeavoured to consult some works on the subject; but not finding anything satisfactory I must rely upon my own practical experience.

In the year 1852, my brother and I possessed a little studio in the Alps, and astonished the mountaineers with Daguerreotype portraits. We received intelligence of the new and incomprehensible invention of taking a negative. My brother immediately departed for Germany, secured the secret, returned, and catered for the new style of portrait. We were delighed with the process; but somewhat disheartened on the appearance of several transparent spots, which of course spoilt our prints.

Here comes my first experience of retouching. The spots were made opaque by ink, and then printed fairly well. Winter came and trade was bad, I therefore migrated to Italy and joined the firm of Messrs. Bianconi, Milan, where I was struck with the splendid quality of the work turned out. I interested myself in the *modus operandi*, and found the effect produced by retouching the negative with carmine, and this could only be effected by certain articles. They not only improved the faces, but added backgrounds, all backgrounds being plain in those days. I became an expert in this kind of work, and hearing it was unknown in Germany, departed to Berlin. My specimens procured me instant employment with the then leading photographer, G. Schoroer. Here I first found pencil retouching performed by a French artist. We exchanged ideas, and much to my advantage. The autumn came, and my carmine retouching failed to give satisfaction; the prints became spotty. The cause could not be discovered, and I was compelled to fall back on the pencil. I wrote to Italy for fresh materials, but with no better result, and eventually discovered my method would not work in a damp climate. On my arrival in England I found pencil retouching universally practised, and in many cases with very pleasing results. I cannot state who invented pencil retouching, but several Frenchmen claim the merit.

Notes.

We have seen attempts to photograph stage scenes, and some of them passably successful, but nothing equal to a series of seven scenes from David Garrick taken at the Criterion Theatre by John F. Roberts. He gives no particulars, excepting that the ordinary light was used. The pictures are quite fully exposed, though slight signs of movement are noticeable in some instances.

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* Communicated to the Cardiff Amateur Photographic Society.

In the matter of the treatment of frames at exhibitions, photographers have not so much reason to complain as artists have. A friend who sent a picture in to the Academy received it back with the sides of the frame starting from each other, leaving a quarter of an inch space at the corners. If the picture had been hung he would not have minded so much, but seeing that it was rejected he is of opinion that the least the Academy officials could have done would have been to have seen that it received no damage.

One of the latest uses to which photography has been put is that recorded by the *Pall Mall Gazette* of Tuesday. A correspondent in the Pacific, writing a description of what the *Pall Mall* calls "A Reign of Terror in Tonga," fearing that his MS. might be lost, took the precaution of having every folio photographed. The account which our contemporary printed was from a photographic duplicate.

It is not easy to say why the Photographic Society should always have had so much trouble over its rules, but it is the fact that difficulties commenced at the first annual meeting, and they appear now to have become chronic. The circumstances in connection with this first meeting are rather curious, and worth recalling. We find that Mr. Rippingham moved a resolution to the effect that no person practising photography professionally or selling his pictures for profit, nor any dealers in chemicals, materials, or apparatus, should be eligible for election on the council. This was carried by a large majority, whereupon somebody raised the awkward point, where was the line to be drawn between a professional photographer making and selling his pictures for profit, and an amateur who sold his pictures? Messrs. Fenton, Le Neve Foster, and the Treasurer of the Society (Mr. Rosling) all declared that they were, by the rule, ineligible, and the Chairman suggested the expediency of recalling the resolution, which was accordingly rescinded by a large majority, despite the protest of Mr. Rippingham that "if the trade once got a footing in the council the ruin of the Society was inevitable." It is to be hoped, when the revision of the rules comes to be discussed, that matters of form will be well considered before a vote is taken. Somehow the Society, in regard to procedure, has such a propensity for falling into traps of its own making, that a lesson might well be taken from the history of the past.

The plan of hiring a bravo to assault somebody against whom you have a grudge is now, happily, almost unknown in England. If it were revised, judging from a case heard this week in the Worship Street Police Court, it would be wise not to have one's photograph taken. In the case in question, the prisoner promised a man two pounds if he would punch the complainant on the nose, and, so that there should be no mistake, gave the man complainant's photograph. Fortunately, the man employed "split," and the result was the action in the police court.

Not long ago, at a meeting of the Photographic Society, a short discussion took place as to whether white or light card mounts are allowed inside the gilt frames in the water-colour department of the Royal Academy. The discussion was not reported, as it simply amounted to A, B, and C saying that such mounts are not admitted, and E, F, and G saying they had repeatedly seen them in the exhibition. No. 1113 in the water-colour room of the Academy is an example of the very glaringly white overmount being inside the frame, and there are plenty of other exhibits in the same room with ungilt card mounts, and still more in the next room, where monochrome pictures are shown. Whether the plain card mount or the gilt mount looks best, remains a matter of opinion.

The answer of Sir J. Fergusson in the House of Commons this week, with reference to the question of passports in France, arising out of the case of Augustus Hare, makes it pretty clear that, while ordinary tourists do not require passports, those who wish to make sketches or take photographs should not neglect this precaution. As Sir J. Fergusson said, "in some countries there were susceptibilities about the making of drawings, and in the eastern parts of France just now there were national and English gentlemen travelling who could not be too careful in providing themselves with every safeguard against arousing suspicion."

The *Philadelphia Times* says that Edison possesses quite a novel collection of mementoes of friends. Instead of asking them for an autograph or photograph, he requests them to speak a few sentences into a phonograph, which, of course, records the sounds. In this way he has secured the voices of nearly three hundred celebrities, among them being the voice of the late Henry Ward Beecher. Whenever he wants to hear a friend's voice he has only to run the record through the machine, and forthwith the sounds are reproduced. This opens up a vast possibility. If phonographic moulds or templets could be sold cheaply enough, they might become an indispensable adjunct to the photographic album. Whenever the latter was inspected, the recording slip corresponding to the portrait of the person would be put into the phonograph, and thus the spectator would not only see the features, but hear the person speak. Supposing the fittings of phonographs were interchangeable, every photographer might supply himself with a machine, and, for a small extra charge, secure the voice as well as the face of his sitter. The latter would, of course, have to give away the record of his speech with every photograph; but this might be simplified by making a long speech, and cutting it up afterwards into as many portions as there were copies of his photograph.

Light, a weekly paper, comes to us in its three hundred and twenty-ninth number; and it is not, as might be supposed, a photographic publication, but one which is to illumine the world by psychical, occult and mystical research. The number, however, before us contains two photographs, said to have been produced in the dark, and to be in some way produced by a sort of spiritualistic agency. They are rather faint, and about uniformly out of sharpness, as if printed on the negative plate by contact from the wrong side of a positive. The best, photographically, is like the head of a man in Eastern costume, and if we had not been told that the photograph is spiritual, we should confidently think that a very conventional retoucher had been at work on the nose.

The member of the Institute of Architects who collates the foreign intelligence for the journal of the Institute has made a discovery which will be read with curiosity by photographers. He writes: "There is something—I have heard it attributed to the climate—which makes the French photo-lithographs of pen-and-ink drawings more agreeable to look upon than many an English one. Though this mode of illustration for architects' elevations and perspectives is only just getting fashionable among the professional journals of Paris, the artists have already showed ahead of their neighbours." It would be extremely interesting to learn how climate can affect the tone of a photo-lithograph. The chronicler of this piece of singular information is evidently unaware that the Parisians are well ahead in all the branches of photo-mechanical printing. They were at work when we scarcely knew anything about it in London, and most of the "dodges" used in the trade come from the French. *La Vie Parisienne* for 1863 contains photographic reproductions of Leech's pictures in *Punch* quite equal to the photo-zincographs of to-day.

A queer story reaches us which shows that people who live by their wits are not yet extinct. A London illustrated paper had copied, by means of photography, some engravings from a Continental journal, and after this had gone on for some weeks a man waited upon the Editor and informed him that he was the English representative of the foreign paper, and that unless a certain sum were paid down he had instructions to proceed for infringement of copyright. As there was something unusual in this course, the London Editor thought it prudent to make enquiries, with the result that the so-called "representative" turned out to be a thorough impostor, having not the slightest connection with the Continental journal in question. The time of this clever personage was, however, not altogether thrown away, for the English journal judged it prudent to abstain from making requisitions on the pages of its foreign contemporary.

It must have been an individual of this type who, as we learn from an advertisement in the daily papers, has been calling on photographers with sample backgrounds of one of the best American houses, which backgrounds he passes off as his own production. It is needless to say that when this person does get an order, the background he turns out is by no means equal to sample.

We find that in 1881 there were in England and Wales 5,352 males and 1,309 females engaged in photography. In Scotland the numbers were 656 and 297 respectively, and in Ireland 252 and 62, making in all 6,260 males and 1,668 females, or a total of 7,928 persons, in Great Britain. What is the proportion of employers out of this number is hard to say. The whole of the females might at all events be set down as assistants, and, perhaps, roughly speaking, so might the males under five-and-twenty years of age. These number 1,088, and deducting this number and the number of females, would leave 4,504. This estimate, however, we fancy would be too high as representing proprietors of photographic establishments alone. There are assistants who are older than twenty-five, and possibly a considerable deduction would have to be made under this head. It would seem, on the whole, that the number of photographers—that is to say, photographers who own businesses—would not be less at the present time than 3,000.

Patent Intelligence.

Applications for Letters Patent.

6076. WALTER CLARK, 45, Southampton Buildings, London, for "Improvement in photographic cameras."—[Complete Specification.]—26th April, 1887.

6082. SOLOMAN ANDREWS and FRANCIS EMILE ANDREWS, 6, Lord Street, Liverpool, for "A new or improved camera obscura for use in taking views and the like."—26th April, 1887.

6249. JAMES ARTHUR RICHARDS, 127, Long Street, Sparkbrook, Birmingham, for "An improved metallic stand or frame for holding views, photos, advertising tablets, and any such like articles."—29th April, 1887.

6331. CHARLES DAY DURNFORD, Ordnance Office, 1, Castle Terrace, Edinburgh, for "Improvements in apparatus for holding and exposing sensitised films or paper, or other flexible substance in photographic cameras."—30th April, 1887.

6353. The Honorable WILLIAM GRIMSTON, 47, Lincoln's Inn Fields, London, W.C., for "An improved appliance for use in treating and washing photographic prints and plates."—30th April, 1887.

6398. HENRY JAMES BURTON, Tyne Villa, Hanwell, W., for "A machine for coating surfaces of glass, paper, metal, or other suitable materials with solutions of gelatine or emulsions of chemical salts or finely-divided pigments."—2nd May, 1887.

Patents Granted in America.

360,909. JOSEPH P. PHELPS, Muscatine, Iowa. "Method of enamelling photographs and other prints."—Filed Dec. 14, 1885. Serial No. 185,638. (No specimens.)

Claim.—1. An emulsion for photographs and other prints, consisting of glutina alba, soft water, albumen, glycerine, and French chalk, in about the proportions set forth.

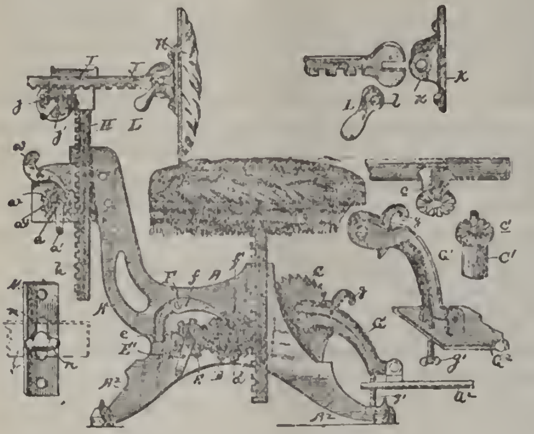
2. An enamelling and tinting or toning composition, consisting of ether, alcohol, gun-cotton, French chalk, and fuchsine, in about the proportions set forth.

3. The herein-described method of enamelling photographs or other prints, consisting in placing the enamelling-emulsion in a line across a smooth surface, then clamping one end of the photograph or print, face down, to the surface over or back, of the body of emulsion, and rolling the print upon the surface by means of a roller, substantially as set forth.

360,855. JOHN W. COOPER, Atlanta, Ga., assignor to Columbus W. Motes, same place. "Photographer's chair."—Filed October 13, 1886. Serial No. 216,121. (No model.)

Claim.—1. The combination, with the foot-rest support, and the foot-rest pivotally connected with its lower end, of the set-screw interposed between said support and rest, substantially as and for the purpose set forth.

2. The combination, with the base having a ratchet-segment, and the foot-rest support having its upper end bifurcated, embracing the ratchet-segment and pivotally connected therewith, of a pawl pivoted within the bifurcated end and engaging the segment to hold the foot-rest support at an adjusted position, the foot-rest pivotally connected with the lower end of its support, and the set-screw interposed between it and said support, substantially as and for the purpose described.

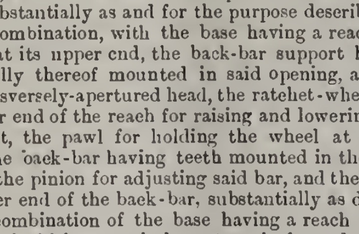


3. The combination, with the base having a reach vertically apertured at its upper end, the back-bar support having teeth longitudinally thereof mounted in said opening, and provided with a transversely-apertured head, the ratchet-wheel supported in the outer end of the reach for raising and lowering said back-bar support, the pawl for holding the wheel at an adjusted position, the back-bar having teeth mounted in the opening of said head, the pinion for adjusting said bar, and the back carried on the outer end of the back-bar, substantially as described.

4. The combination of the base having a reach through the upper end of which a vertical aperture is formed, the back-bar support adjustably held in said opening, and having a transversely-apertured head, the back-bar adjustably held in the opening of said head, and the back secured to the end of the back-bar and adjustable relative thereto, substantially as and for the purpose set forth.

5. The combination of the back-bar having a bifurcated end, the casting secured to the seat-back, and having lugs extending therefrom embracing the bifurcated end of the back-bar and transversely apertured, and the cam-lever pivotally supported between the lugs of the casting, and interposed between them and a side of the bifurcated end of the bar, substantially as and for the purpose described.

361,070. John T. Long, Menomonee, Wis., assignor to himself and Otto L. Seymour, La Porte, Ind., for "Photographic print washer." Filed Oct. 25, 1886. Serial No. 217,148. (No model.)



Claim.—1. In a photographic print washer, the combination, with a swinging tray, of an oscillating tray actuated by water discharged from the swinging tray, substantially as described.

2. The combination of the tray E, provided with discharge-openings *l m* at opposite ends, and pivotal studs *p* and studs *o*, the frame A, provided with the notched standards *a* and the tranverse rod *b*, the rocking tray C, having a bottom formed of two sections, D D′, elevated in the middle of the tray, the bars *d d*, provided with notches *e* at ther lower ends and slots *f* at their upper ends, and the valves *h*, provided with stems *i*, substantially as described.

3. The combination of the tray E, provided with discharge-openings *l m* at opposite ends, and pivotal studs *p* and studs *o*, the frame A, provided with the notched standards *a* and the tranverse rod *b*, the rocking tray C, having a bottom formed of two sections, D D′, elevated in the middle of the tray, the bars *d d*, provided with notches *e* at their lower ends and slots *f* at their upper ends, the valves *h*, provided with stems *i*, and the sprinkler-nozzle F, substantially as described.

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.*

[*Reprinted from the* Photographic Times.]

Niepce secures Photographs in the Camera.—Having obtained pictures by what we may call contact-printing, Niepce's next endeavour was to apply his process to securing the beautiful views produced by the aid of a camera. For this purpose he tried the chlorides of silver and of iron, and gum guaiacum, whose sensibility to light had been investigated by Wollaston in 1804. Nothing, however, answered so well in his hands as the surface of bitumen or asphalt, with which he had already been successful in heliography. When exposed to the action of the light forming the picture within a camera, the bitumen became insoluble in proportion to the intensity of the light by which the various parts of the image were produced; an effect which we now know to be due to the oxidation, and consequent hardening of this resinous substance. When the resinized plate was removed from the camera, no picture at all was visible on its surface. But by steeping the exposed plate in a mixture of oil of lavender and petroleum, the still soluble portions of the bitumen were removed. The shadows of the landscape were then represented by bare portions of the metal plate, while the insoluble resin which remained indicated the high lights. Obviously such a picture would look more natural if the portions of polished metal exposed could be darkened, and for this purpose we know that Niepce employed various chemicals, and among others iodine.

Correspondence of Niepce.—It is unfortunate that Nicèphore Niepce never published a single line descriptive of his methods, so that it is only from his correspondence—and more especially his letters to his brother Claude—that we can glean our information. The difficulties of an experimenter in an obscure French town, seventy years ago, were indeed great. Niepce tells us that his first camera was fashioned out of a cigar box, while his lenses were "the lenses of the solar microscope, which, as you know, belonged to our grandfather, Barrault." In a letter written to his brother in 1816, Niepce describes how he secured what was probably the first picture ever taken in a camera: "My object glass being broken, and being no longer able to use my camera, I made an artificial eye with Isidore's ring box, a little thing from sixteen to eighteen lines square. . . . . I placed this little apparatus in my workroom facing the open window looking on to the pigeon house. I made the experiment in the way you are acquainted with, and I saw on the white paper the whole of the pigeon house seen from the window. . . . . One could distinguish the effects of the solar rays in the picture from the pigeon house up to the window sash. The possibility of painting by this means appears almost clear to me. . . . . I do not hide from myself that there are great difficulties, especially as regards fixing the colours, but with work and patience one can accomplish much."

"Work" and "Patience"—truly Niepce himself combined these in no common degree! From the reference to white paper used in this early experiment, it would seem probable that silver chloride was employed. We know that Niepce used the substance, and that he gave it up because, like Wedgwood and Davy, he was unable to fix or render permanent the pictures secured by its aid.

Niepce's Agreement with Daguerre.—This agreement bound the two investigators to communicate to each other all the processes which they had discovered for fixing the camera image; and it went on to state that the two inventors were to share equally in any profits that might be obtained. In compliance with this resolution, Niepce drew up the following important statement, which is dated December 5th, 1829: "The discovery which I have made, and to which I give the name of heliography, consists in producing spontaneously, by the action of light, with gradations of tints from black to white, the images received by the camera obscura. Light acts chemically upon bodies. It is absorbed; it combines with them new properties. Thus it augments the natural consistency of some of these bodies; it solidifies them even, and renders them more or less insoluble according to the duration or intensity of its action. The substance which has succeeded best with me is asphaltum, dissolved in oil of lavender. A tablet of plated silver is to be highly polished, on which a thin coating of the varnish is to be applied with a light roll of soft skin. The plate when dry may be immediately submitted to the action of light in the focus of the camera. But even after having been thus exposed a length of time sufficient for receiving the impressions of external objects, nothing is apparent to show that these impressions exist. The forms of the future picture remain still invisible. The next operation then is to disengage the shrouded imagery, and this is accomplished by a solvent, consisting of one part by volume of essential oil of lavender and ten of oil of white petroleum. Into this liquid the exposed tablet is plunged, and the operator observing it by reflected light, begins to perceive the images of the objects to which it had been exposed, gradually unfolding their forms. The plate is then lifted out, allowed to drain, and well washed with water." To this Niepce adds: "It were, however, to be desired that, by blackening the metal plate, we could obtain all the gradations of tone from black to white. The substance which I now employ for this purpose is iodine, which possesses the property of evaporating at the ordinary temperature." We cannot but admire the graphic description of the phenomena of development here given by Niepce, and, without doubt, it formed the foundation of all the discoveries in photographpy that followed. It will be noticed that Niepce's method of development was a physical one only, for it consisted in simply washing away by a suitable solvent the unacted-on and therefore still soluble parts of the bitumen.

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* Continued from page 231.

Defects of Niepce's Process.—The chief objection to the beautiful and ingenious process discovered by Nicéphore Niepce was the great length of time for which the bitumenized plate needed to be exposed in the camera. For an ordinary landscape an exposure of from six to eight hours was required. During this time the shadows of objects changed from one side to the other, so that the resulting pictures were comparatively flat and spiritless, being devoid of the charming effects resulting from the contrast of light and shade. Another trouble arose from the fact that in the half-tones of the picture the bitumen was only hardened at the surface, the layer beneath remaining soft and soluble. When the developing liquid was applied this lower layer was apt to be dissolved, and in the final washing it sometimes carried away with it the hardened upper portion, so producing bare patches or defects.

Experiments in Heliography.—Most black varnishes are made from asphalt, and we can easily imitate Niepce's process by coating a glass or metal plate with a thin layer of such varnish, and exposing it under a negative to bright sunshine. By subsequent washing with petroleum the picture is readily developed.

FOX-TALBOT AND THE CALOTYPE PROCESS.

Life of Fox-Talbot.—While Daguerre was pursuing his researches into matters photographic in France, another worker was advancing toward the same goal in England, though by a different road.

Henry Fox-Talbot, born February, 1800, was of a high lineage; the Talbots taking rank among the oldest families in England; while his mother—Lady Elizabeth Fox-Strangways—was the eldest daughter of the Earl of Ilchester.

The future discoverer of photography graduated at Cambridge with high honours, in 1821. He sat for two years in Parliament, but politics had no charms for him, and in 1834 he retired from public life to devote himself wholly to scientific research.

Talbot was a very versatile student of nature. His earliest work was mathematical; but between 1826 and 1834 he published five papers upon various phenomena connected with light. Then for many years photography engrossed his thoughts; but in after life he studied and wrote on "Spectrum Analysis," the "Cuneiform Inscriptions of Egypt," &c. Altogether fifty papers from his pen appeared in various scientific periodicals between 1822 and 1872.

Fox-Talbot died at his family seat, Lacock Abbey, in Wiltshire, on the 17th of September, 1877, full of years and honour. As a discoverer of photographic processes, he may fairly claim to be placed on an equality with Niepce and Daguerre.

Talbot's Early Work in Photography.—Talbot tells us that it was in 1833, while sketching the beautiful scenery of the Italian lakes with the aid of a camera obscura, that he was struck with the idea that it might be possible to fix, and retain permanently, the exquisite facsimiles of surrounding objects produced by the aid of that instrument.

Six years of steady work at the problem followed, at the end of which the publication of Talbot's process—for he succeeded in devising a means by which his object was attained—was hastened by the news that a Frenchman had also achieved success in fixing the camera image.

It was on the 25th of January, 1839, that Professor Faraday described the new method of "Photogenic Drawing" (for so Talbot styled his invention) to the members of the Royal Institution—then, as now, a very popular scientific club—and invited them to inspect a collection of drawings produced solely by the aid of light. On the 31st of the same month, a paper giving a full description of the method was read by Talbot before the Royal Society; this paper was shortly afterwards published in the *Philosophical Magazine*. Thus the publication of Talbot's process was made before that of Daguerre.

But, when the two methods came to be compared, it was found that they were essentially different. Talbot had followed up in his photographs on paper the line of research indicated by Wedgwood, while Daguerre's method with polished silver plates was built upon the foundation furnished by Niepce; thus each had completed the work of his own countryman.

The Method of Photogenic Drawing.—Talbot's success was due, in the first place, to the fact that he had succeeded in rendering chloride of silver far more sensitive to light than Wedgwood or Davy had been able to do. Taking fine writing-paper, he soaked it in a weak solution of common salt, and then brushed one side of the paper twice over with a solution of nitrate of silver. When this was done, what chemists call "double decomposition" took place, and the chloride of silver was formed in the pores and upon the surface of the paper; while mingled with the chloride there was also a slight excess of the nitrate of silver. It was to this use in combination of the two salts of silver—the nitrate being in excess—that the increased sensitiveness to light which paper so prepared was found to possess was due. Talbot found that paper treated in this was was darkened by even a momentary exposure to bright sunlight. By its aid he readily secured images of objects in the solar microscope. But his crowning triumph was attained when, after an exposure of about an hour, he succeeded in obtaining an impression of the picture formed by the lens within the camera obscura. Talbot states that he had reached this point in 1835, and that in that year he secured several camera pictures of his residence, Lacock Abbey.

How Talbot Fixed his Pictures.—It will be remembered that it was the want of a fixing agent which baffled Sir Humphrey Davy in 1802. But Talbot was more fortunate. After well washing his photographs, he soaked them either in a solution of common salt, or in a solution of potassium iodide. By this treatment he found that his pictures were rendered permanent; at least, they could be freely examined in the daylight without further darkening.

(*To be continued.*)

Correspondence.

THE USE OF COLOURED SCREENS IN TAKING NEGATIVES.

Sir,—I have lately obtained two coloured screens from a Paris optician, made to fit into the lens hood. One is yellow and especially for use out of doors, the other is green and is recommended to assist in getting a better translation of more brightly coloured objects, such as paintings; and they are supposed to be advantageous when used with ordinary plates, that is plates not specially prepared for orthochromatic results. An ocular examination with the spectroscope shows that the yellow screen gives an inappreciable general absorption, and has a slight effect in stopping the more refrangible rays; and that the green screen produces a very visible amount of general absorption, and has a very considerable effect upon the blue and the less refrangible part of the red. I have tried the effect of these screens in photographing the coloured chart issued a few weeks ago in the Photographic News, and I attached to the chart a piece of dress material of a very marked plaid pattern of two colours, a rather light red and a dark blue. In the results I cannot detect any improvement whatever in the rendering of the colours by the use of the screens, and the plaid was wholly patternless in each case. As to the manipulation, a Cadett's plate was used, the three negatives were taken on the same plate by covering over the part not to be exposed, and they were developed simultaneously in the same dish with pyro and ammonia, and printed together in the same frame. The exposures given for the negatives were for no screen, the yellow screen, and the green screen, as 1 to 4 to 16, and the last was rather under-exposed as compared with the others. I enclose the three prints and the piece of plaid used, and if you, sir, can find any improvement in those taken through the screens, I shall be glad to know that the practical result is more concordant with the theoretical notion than it appears to be.

Chapman Jones.

THE BIBLIOGRAPHY OF PHOTOGRAPHY.

Dear Sir,—Pity the sorrows of a poor writer whose critics will not read what he has written. First Mr. Spiller, then Mr. Lang, and last, and worst of all, Mr. Werge, who actually thinks it possible that I could omit from my lists of books on photography so well known and deservedly popular a book as that by the late Jabez Huges! Why, sir, Mr. Werge sent me (very kindly) that identical book himself, last year, and it is chronicled in two places in my lists (see Photographic News 1886, April 16, page 242; and July 9, page 436). I almost think Messrs. Spiller, Lang, and Werge must be mistaking the few books named in my *supplementary* list, for those named in the *main* lists which have been appearing in the Photographic News month by month during 1886.

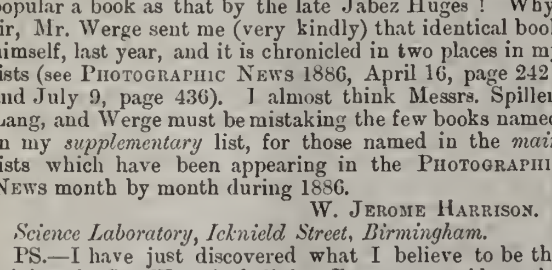
W. Jerome Harrison.

Science Laboratory, Icknield Street, Birmingham.

PS.—I have just discovered what I believe to be the origin of Mr. Werge's belief. By some accident the printer has omitted the name of Jabez Hughes from the separate list of authors given last week; but his book is duly described in the places cited.

"BUSINESS MANAGEMENT"—SKETCH OF THE STUDIO DESCRIBED.

Sir,—You having forwarded to me a letter written by a correspondent who would like to have a sketch of the studio described on p. 227, I now forward what is asked for. In order to get similar effects in lighting, the dimensions given in the above-mentioned article need not, of necessity, be strictly adhered to, especially if found to be inconveniently large; but when space admits, and no other difficulties of importance are presented, the advantage of a roomy studio will be appreciated.



If a structure—say, one-fifth or one-fourth smaller than that given be chosen—the skylight ought to be smaller in proportion also; but an endeavour should be made to adjust the sash at an angle of 60°, and a northern aspect is usually conceded to be by far the most effective.

The Writer of the Articles.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 28th ultimo, A. Haddon in the chair.

An instance of the inequality of standard sensitometers was introduced by A. Cowan. Three plates of equal sensitiveness were exposed in separate instruments, and the result afforded a difference of five numbers.

Attention was drawn by A. L. Henderson to an advertisement of some special form of apparatus, likewise to a wire clip for securing the focussing cloth in breezy weather. He found an ordinary "safety pin" useful for this latter purpose.

H. M. Hastings showed the result of a series of comparative experiments in developing platinotype paper with potassium carbonate, sodium carbonate, and potassic oxalate, cold, and with varying degrees of heat. In some cases pre-exposure of one minute's duration to daylight had been resorted to, and the effect retarded or destroyed by the addition of a minute trace of hypochlorite of lime. This agent was also found to prevent fog, and destroy any discolouration due to keeping platinotype paper in stock for a few months, but the exposure had to be lengthened. The addition of one drop of a ten per cent. solution of chlorine to the developer was found to stop developing action completely.

Arising from a question under discussion,

W. B. B. Wellington spoke of the properties of cyanine (vol. xxx, p. 193) as an orthochromatic agent. Ordinary bromide plates dipped in a solution of this dye became much less sensitive to blue, he said, whilst that of red and green were much increased. Moreover, the process was free from patent restrictions.

F. W. Edwards showed several waste prints (silver) illustrative of different kinds of spots to be met with in practice. Although the subject was very instructive, to beginners especially, and interesting to old hands as well, yet Mr. Edwards failed in his attempt to elicit discussion upon the probable causes. This gentleman threw out a suggestion with regard to halation, in which he stated that the difficulty would cease if the sensitive mixture were spread over a ground surface of glass instead of the usual polished plates. He had tested this method, and was able to recommend it.

North Surrey Photographic Society.

The fortnightly meeting was held at the "Greyhound" Hotel on April 27th, J. Brown in the chair.

Lewis Wolff explained a method of storing negatives, which has three distinct advantages over the old system of grooved boxes, viz., saving of space, this method requiring but one-third the room necessary for the orthodox boxes; secondly, a particular negative can be quickly found from amongst a large number; thirdly, the cost is less than half the price of grooved boxes. This method consists simply in separating the negatives with sheets of paper cut to the exact size of the negatives, the four corners of each sheet having small triangular pieces of card glued on them to prevent the negatives pressing against each other; each dozen negatives with these intervening leaves is placed in a stout card box with hinged lid and falling front. On the back of each box is a label with spaces for number of box and names of twelve negatives. He (Mr. Wolff) next showed a curved support for bromide paper in making enlargements. By means of this easel the bromide paper is made to take a curved form for the purpose of obtaining good definition at the ends of the paper without the use of small stops, the object being to reduce the time necessary for making the exposure. By the use of this curvature the exposure can be reduced to a quarter or one-eighth of the time required with a small or medium stop.

A developer consisting of pyro, potash, and ammonia was described by Mr. Wolff, who showed specimen negatives, and pointed out its advantages. In the use of it he first applies the bromide and pyro* to the exposed plate, next the carbonate of potash, and lastly the ammonia. Negatives thus developed have the cleanness and detail usually obtained with potash, combined with the vigour given by ammonia. The chance of fogging during long development is greatly reduced by this method. Mr. Wolff showed some Eastman-Walker stripping films developed in this way which were excellent, and he particularly recommended workers using these films to try his method of development.

There will be a special business meeting on May 4th, and on May 11th there will a lantern exhibition of members' slides.

Birmingham Photographic Society.

A meeting was held in the Technical School, Bridge Street, on the 28th inst., W. J. Harrison in the chair. A. Constantine and A. W. Robinson were elected members of the Society.

A large number of photographs were exhibited by Harold Baker, A. Bonehill, Dutton (stripping films), Harrison, Karleese, Pickard, and Thos. Taylor.

The excursion on the 7th of May was arranged for Lichfield, A. Pumphrey to be leader.

Mr. Nock then gave his paper on "Retouching," remarking that too much retouching frequently spoilt the pictures; in many cases, even of professional work, the finished print was really nothing like the person taken. For his own part he preferred a picture only retouched enough to relieve the shadows and soften the high lights in cases such as freckles, and people who were apt to show a contracted scowl; these must be retouched. Then flat pictures by a similar method can be made to look rounder in the features, &c. He then threw an enlarged picture (by means of the lantern) of a bad negative on to a tissue paper screen, and proceeded to work it up by crayons, and showed how retouching should or should not be done. Some half dozen examples were very effectively done and altered. The lecturer concluded by offering his practical advice at any time to the members.

A. Pumphrey then read a paper on "Flexible Films" (see page 278). An animated discussion on both papers followed, and the meeting terminated with the announcement of the paper for next meeting, "Reminiscences of Photography," by Mr. Osborne.

Society of Amateur Photographers of New York.

The Presidential Address.

At the annual meeting held on the 12th April, the retiring president, F. C. Beach, made a report of which the following is an abstract:—

It affords me much pleasure to lay before you this evening a report of the work that has been accomplished at the termination of the third year of the Society's existence; not only because, as a Society, we have succeeded in overcoming many difficulties which usually beset young organizations, but also because we are to-day strong, well equipped, and prepared to advance toward a higher plane of usefulness.

In giving an outline of the work of the year, I should not fail in the beginning to speak of the death of our valued friend and director, Mr. Gilbert A. Robertson, who, so many of the older members may remember, took an active part in promoting the interests of the Society. His demise took place the latter part of the night of our last annual meeting. Fortunately, so far as I am aware, we have lost no members by the same cause during the past year, and I trust we may all live long to enjoy the benefits and privileges which the Society may grant.

Beginning with the annual meeting of April 13, 1886, I note the following results. After the reading of the annual reports of the several officers and committees, a report of the Joint Exhibition Committee advising the co-operation of this Society in joint exhibitions to be held annually with the societies in Philadelphia and Boston was submitted. On the walls hung the second Presentation Print exhibition, which had been successfully completed through the efforts of Messrs. Walker and Baker. Mr. Carbutt exhibited a highly coloured almanac, with negatives made from the same on ordinary and orthochromatic plates. Mr. Newton spoke of locally intensifying negatives by covering the portions not to be treated with oil or vaseline. Mr. W. I. Chadwick, of the Manchester (Eng.) Society, who was present on being introduced by me, gave an amusing and interesting chat on English societies. In referring to our American apparatus, he said it was quite different from theirs. He regarded the dry collodion process as the best for lantern slides.

April 27th.—Death of Gilbert A. Robertson, a director of the Society, was announced, followed with some touching remarks on his services and character by Dr. Janeway. Report of the judges, Messrs. F. Rondel and Theodore Gubelman, awarding the Presentation Print, entitled "Surf," to James F. Cowee, Troy, N.Y. The Lantern Slide Committee reported the standard size for lantern slide plates should be 3¼ by 4 inches. Adopted. Then followed a lantern exhibition of one hundred slides contributed by the Cincinnati Camera Club. Meeting closed with discussion on the cause of the "Fading of Albumen Prints." It was the last meeting held in the old quarters, 1260 Broadway.

On May 1st, under a lease for two years, the Society took possession of the present quarters, then but a mere shell or barn of a building used for the storage of furniture and the like. So much had to be done to put it in presentable shape, that the officers were obliged to postpone the first regular meeting from the second Tuesday in May, to Friday, May 21st, and I am proud to say that our first meeting held here was most enthusiastic and promising, the hall, in fact, being really too small to accommodate all the members and friends who desired to attend. The reason was, doubtless, due to the fact that we had for our chief entertainment the excellent and instructive "Charcoal and Chalk Talk" of our honoured member, Mr. J. Wells Champney. Resolutions expressive of the esteem of the Society for Mr. Gilbert H. Robinson's services were passed, also an amendment to the constitution reducing the number necessary for a quorum of directors from six to five. Mr. Walter Clark's new camera for instantaneous work was exhibited. The award of a prize of fifty dollars by W. D. Holmes to Cyrus Prosch for the best shutter, called "The Duplex," was announced.

June 8th.—Proposed Rules for Joint Exhibition submitted by New York Committee. Exhibition of Professor Laudy's apparatus for supplying oxygen as needed for the lantern very successfully worked. Table of the intensity of lime lights. Mr. Newton's soda and potash developer discussed. Glazing of albumen and bromide prints. Exhibition of the Satchel Camera.

June 22nd.—Report of the Philadelphia Society's Joint Exhibition Rules read. Donations of books by Dr. John H. Janeway, H. M. Grisdale, and Mrs. Rebecca I. Robertson. Lantern exhibition of the Philadelphia Amateur Club's slides, and those made by our own members; also sixty slides donated by F. J. York, of London.

During the hot weather of July no regular meetings were held, but the improvements in the dark room and other facilities afforded were almost daily used by some member of the Society.

July 22nd.—Field excursion up the Croton River, N.Y.

August 25th.—A summer "experience" meeting was held. Formula of Warner's potash developer given. Prize silver cup proposed by Mr. T. H. Blair. Exhibition of the twenty-five cent. Pinhole Camera, also Nash's boy's camera. Mr. Fisk related his experiences with the Customs authorities in Canada. Mr. Simpson also spoke of the difficulties to be met with at Manhattan Beach.

September 14th.—The employment of a photographer to do printing for members was announced. Letters from Joseph R. Greatrer, relative to candle-power of the lime light, and a circular letter from T. H. Blair on the prize silver cup, were read. Exhibition of Warner's Light-tight Plate Holder, also of Mr. Glover's Detachable-leafed Album. Exhibition by Mr. Frederick E. Ives, of Philadelphia, of his Ether-oxygen Lime Light Lantern and Apparatus. Specimen pictures taken from a painting of the "Midnight Sun" on different orthochromatic plates were shown. Discussion on "Screens for Lantern Projections." David Cooper gave an account of photographing coloured buildings. Adee's pyro formula for lantern slides and Jackson's formula for potash developer were given. Mr. Rockwood related some reminiscences of his summer trip to Europe.

September 29th.—First fall lantern exhibition; Pitsburg and New York Societies' slides. Letter from Thomas Plener, of Vienna, Austria, relative to the cause of the silvering appearance in gelatine films.

October 12th.—Exhibition of Barker's Improved Camera and Lewis Tripod. Mr. Grisdale showed his special attachment for 5 by 8 cameras adapting it to be used for 4 by 5 plates. A new Combined Camera and Changing Box by Mr. Loeber was shown. Mr. Apgar exhibited an Improved Duplex Shutter. Paper entitled "An Amateur's Experience Photographing in the Rocky Mountains," was read by Randall Spaulding. Mr. Beach showed an Improved Chimney for Magic and Enlarging Lanterns. Dr. Janeway discussed "Don'ts, and what will we do with them." Discussion on development of plates.

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* For pyro the Platinotype Co.'s preparation is used.

October 20th.—Field excursion to Passaic, N. J. Party entertained by Secretary Granger at his residence.

October 22nd.—Meeting of the First Joint Exhibition Council at the Society's quarters, representing the Photographic Society of Philadelphia, the Boston Camera Club, and this Society. Formal rules and regulations were adopted to govern the united exhibitions, as they were to be annually given in the respective cities. Present at the meeting were C. W. Canfield, F. C. Beach, John T. Granger, Robert S. Redfield, John G. Bullock, and George E. Cabot.

October 27th.—Rules established by the Joint Exhibition Council were accepted and adopted. Dr. W. G. Thompson gave an interesting lecture on "Photographing the Heart in Action," exhibiting his special apparatus for the purpose. Mr. William H. Rau, of Philadelphia, read a paper on "The American Film Paper," giving directions for working it. He also gave a practical demonstration showing how readily the film was removed from the paper.

October 28th.—The Bartholdi excursion down the harbour. Noted for the number of poor pictures secured and for the substantial financial results.

November 9th.—Appointment of Special Committee on a Society Portrait Album. Paper read by F. C. Beach on "Pyrogallol," communicated to the Society by Professor Spencer B. Newbury. Instructive remarks on "Composition in Photographic Pictures," by J. Wells Champney, with practical illustrations by matting out lantern slides and projecting them on the screen. Exhibition at the same time of Tisdell's Improved Lantern and Apparatus, wherein the oxygen gas for the lime light is manufactured as used. Discussion on the Question Box Questions.

November 18th.—Entertainment and steropticon exhibition at Association Hall. Address on "Amateur Photography" by F. C. Beach. Humorous recitations by James S. Burdett, followed by a lantern exhibition of English views.

December 14th.—Reports of Society Album and Lantern Slide Committees read. Interesting remarks on "Anatomical Photo-micrography," by Dr. J. West Roosevelt, followed by an exhibition of his apparatus. Paper on "Unboiled Emulsions," read by Professor Spencer B. Newbury. Remarks on "Spots and Pinholes in Plates," by Dr. Janeway. Discussion on "Faults in Plates," also discussion on "Best Light for the Dark Room."

December 29th.—Lantern exhibition of one hundred London Camera Club slides.

January 11, 1887.—Improved Hoover Shutter exhibited. Paper on "The Vergara Dark Slide and Improved Woodbury Tissue" by F. C. Beach, followed by a demonstration on the development of the tissue. Communication by W. E. Partridge on "Development in the Field and a Record Book," read by George H. Cook, Secretary *pro. tem.* Paper on "Development of Lantern Slides with Pyro," read by F. C. Beach. Appointment of a Special Committee on Dark Room Lights. Demonstration on the development of ferrotype dry plates by D. C. Hoover.

February 8th.—Exhibition of Tisdell's Improved Detective Camera. Paper on "Enlarging on Bromide Paper," read by F. C. Beach, followed by demonstration. Discussion on the development of plates, also on the standard weight of an ounce. Paper read by Dr. John H. Janeway, on "Formulas for Developers: How should they read."

February 23rd.—Lantern exhibition of one hundred slides contributed by the Cincinnati Club, also a few by our own members. Campbell improved Fly-open Exposing Shutter was shown.

March 8th.—Dr. Janeway replied to several questions in the Question Box. Interesting experiments on "The Reflection, Refraction, and Polarization of Light," by George M. Hopkins.

March 23rd.—Lantern exhibition of the Boston Camera Club's slides, Fairchild's improved lime light lantern employed, in which both gases are generated as fast as used.

March 26th.—Opening of the First Joint Annual Photographic Exhibition at Ortgies Gallery, 845, Broadway, lasting one week. Four lantern exhibitions given.

From the reports of the Librarian and Chairman of the Lantern Slide Committee, it will be noticed that the donations of books, photographs, and slides to the Society during the past year have been extensive.

During the early part of this year it was decided to adopt the policy of renting for a small fee, to members or their friends, cameras, lenses, &c.; and it has been suggested that as soon as the many permanent improvements have been completed, a portion of the surplus revenue of the Society be used for the purchase of different kinds of lenses and apparatus. It frequently happens that one member has to borrow another's instrument to do a certain class of work; but, by having on hand, ready for immediate use, a number of cameras, lenses, and tripods of different sizes, a member will not only have a chance to try, before purchasing, the kind of apparatus he takes a fancy to, but can go off on a two or three weeks' vacation with an expensive instrument which, perhaps, he could not afford to purchase. Of course, certain regulations will need to be established to secure the Society against loss. Another convenience for members which has been arranged is the sending to the Society, on consignment by the plate manufacturers, of small lots of their latest and best plates, and I am happy to say the idea is meeting with favour. Small quantities of chemicals are also kept on hand. There is no reason why a Society of our standing should not provide for the convenience of its members a few needed supplies, any more than a boat club provides boats and persons to care for them, or for an athletic club to provide clothing, tools, and equipments.

Since last September a photographer has been engaged to do printing for members, and as the experiment has proved to be a success, his employment may be regarded as permanent. At a recent meeting of the Board it was decided to pay the photographer a stated salary, the Society to supply all the material.

It was with some hesitation that the officers negotiated for the lease of the present quarters last year, because of the doubling of the rent, and the large expense involved to make the necessary improvements. The risk was something which many members would not care to shoulder, hence I feel that we should be especially thankful to the directors elected at that time for their willingness to take a personal responsibility in the possible debts that might have been incurred. My prediction then was that in case we took this place and fitted it up with all the modern conveniences for photographic work, we would largely increase our membership, and be able to materially add to our income. That this prediction has been more than fulfilled, is clearly shown by the marked increase of membership as reported by the Secretary, by the report of the Treasurer, and also by the fact that at first we supposed sixteen single lockers would supply all the wants of members who would care to work here, until now we have over seventy. It is fair to presume that as the membership increases, over one hundred lockers will be needed, hence it is plain that our present quarters are becoming too limited, and we should take steps either to enlarge what we have, or secure more commodious quarters elsewhere.

Concerning the proposed glass-house talked of last year, it may perhaps be well for me to say a word in explanation. Plans were made for a glass-house, but it was found the outlay necessary to build it and restore the building back again, in case the Society moved out, was going to be so heavy, that it would not pay, considering the short lease we had. The matter will doubtless be pushed as soon as a longer lease can be obtained, or other and better quarters are secured.

In looking over the work of the year, I find that we have not fallen behind the previous one. Very few papers have been read by members in comparison to the large number of the latter, and I trust the coming year will spur others to do something for the Society. When you discover anything that is useful, helpful, and important, don't keep it to yourself, but communicate it to the Society at large.

We have had a larger number of lantern exhibitions than in any previous year, and I am gratified to observe that a greater degree of interest is being shown in this interesting branch of work; also to notice that the work of several members of our Society compares very favourably with that of others. We need to aim for a higher standard, embodying with the perfection of mechanical detail the qualities of artistic composition.

Mr. Champney's remarks in May, and his admirable plan of matting out the non-essential parts of a picture in a lantern slide as shown to us last November, I firmly believe are bearing good fruit. This advice is not to rely on one uniform mat for all sorts of pictures, but to suit the mat to the picture. We thus add more variety to the pictures as they appear on the screen, and show something worth looking at every time.

As will be noticed from a report of the Lantern Slide Committee, the interchange of lantern slides in this country among societies here, and the international exchange with the London

Camera Club, has been successfully carried on, and has resulted in adding a large number of interesting foreign slides to our permanent collection. It is probable now that the plan is so well organised, better pictures will be produced, which will tend to make our lantern exhibitions more entertaining and instructive.

The most striking event in the Society's year just closed is the very successful photographic exhibition recently held at Ortgie's Gallery. So well done was a majority of the work displayed, both in its technical and artistic qualities, that the Board of Judges, as shown by their report, were puzzled to whom to make awards. It was a task far greater than they expected, plainly proving that the amateur, when applying thought and study, can turn out work of supeior excellence. That the exhibition has and will result very beneficially for the Society no one can deny, while the fact that we have the honour of holding it first on a grander scale than any previous exhibition will always stand out as a pleasant remembrance in the history of the Society. It is also gratifying to know that some of the best examples of work were presented to the Society at the close of the exhibition. My only regret concerning it is that so few of our members, in comparison to our size, contributed pictures. We should have made a larger display. My hope is that its success will stimulate a better showing for next year. In is only by carefully conducted exhibitions that we can note the progress of the art. In this they are as useful as the exhibitions of modern paintings.

During the past year no specially new or prominent discovery has been made, but much thought and experimenting has been given to the preparation of plates sensitive to colours, and it is believed considerable advance has been made in this direction in this country. It is a very interesting subject for investigation.

I believe it is generally considered that the manufacturers of dry-plates are taking more pains than formerly, for we hear of fewer complaints. There is still room for improvement.

I recently learned from an American travelling abroad, who is well posted on emulsions and the chemistry of photography, that the trouble with American plates was in the small proportion of silver they contained. As a rule he found they varied considerably, and with them he was unable to obtain uniform results; whereas with a certain brand of English plates, well known for their uniformity in having an invariable standard of silver, he never missed in obtaining an excellent crisp, clear negative. It has been my experience to note this variableness in plates here, and I believe I am not alone in that experience. Our American plates are certainly put up in better shape than formerly.

It is interesting to note, on the subject of developers, a majority of the manufacturers of plates here are about equally divided between pyro and soda, pyro and potash, pyro and soda and potash. Amateurs largely prefer pyro and potash, which works with the best effect on under-exposed plates, especially when the latter are of the insoluble, non-frilling kind.

The catalogue of the recent photographic exhibition shows that out of 100 exhibitors, 37 preferred soda, 3 potash and soda, 38 potash, and 18 ammonia as an alkali; 7 preferred oxalate and iron. If this is any criterion of the practice of the photographers throughout the country, it may be set down that potash and soda are the most popular and reliable alkalies.

So far as I am able to learn, the use of paper as a substitute for glass has not been so extensive as it was first thought it might be. Those who use it invariably turn to the American film paper, where the transparent gelatine film can be removed after the picture is developed. Three or four of the members of this Society have successfully worked it. The emulsion, however, is said to be not quick enough for extreme instantaneous work. Next in convenience to this appeared the Woodbury film, a step in the right direction, but yet not fully complete. The gelatine is not sure to cling to its transparent paper support, particularly when development occurs in a strong alkali solution. I believe if these minor defects were overcome it would furnish the film needed for the amateur.

One very encouraging feature of the year is the admittance of ladies to the membership of the Society. When they can do such fine work as was shown at our recent exhibition, I feel that we have done the wise thing in accepting their proffered encouragement by admitting them.

The present cordial relations existing between this and other home and foreign societies should be continued and fostered. Already the Camera Club, of London, is becoming of substantial benefit to our members travelling abroad. We, in turn, will welcome them here, affording every facility within our power.

It is surprising to note the number of new clubs springing up all over the country. The fact seems to show that the practice of amateur photography is becoming extremely popular as an amusement, requiring, by means of such associations, an organ to advance it towards a higher state of perfection.

That this Society has prospered since its organisation no one can gainsay, and in becoming the exponent of all that is new, useful, instructive, attractive, and good in the art of photography, it fulfils a mission which will be enduring.

Our prominent standing to-day before the photographic and the outside world is the result of hard, earnest, systematic work. Let us strive to maintain and preserve it, and press on to a still higher standard.

I would not fulfil my duty if I did not extend to my fellow directors my sincere thanks for their faithfulness in conducting the affairs of the Society.

As for myself, I have only to say that I have striven, in season and out of season, day and night, to push the standing of the Society along, hoping to make it a permanent success. How far I have succeeded I leave you to judge. I am conscious that I may have committed many mistakes, which I sincerely ask you to overlook.

Thanking you all for your continued support of the Society, and for your kind indulgence in the past, I close with the hope that our present prosperous institution may go on and prove still more beneficial to us and to its future friends.

Talk in the Studio.

Photographic Society of Great Britain.—The next ordinary meeting will be held on Tuesday next, May 10th, at 8 p.m., at the Gallery, 5a, Pall Mall East, when a paper by J. B. Spurge will be read, being the second part of his paper read at the February meeting.

Hygrometer for Carbon Printers and Others.—From Alf. J. Mercer, of 16, King Street, Sparkbrook, Birmingham, we receive a convenient little hygrometer, which he thinks may be useful to those engaged in photographic processes, and by the use of gelatine. In size and general style it resembles the smallest pattern of American round clock, and the index is worked by a thread impregnated with a hygroscopic material.

Holmes' Ozone Bleach.—This solution—which is supposed to consist of an alkaline hypochlorite—is, as our readers know, often used as a reducer for over dense negatives; the advantage of using such a preparation having been pointed out by W. E. Debenham, and subsequently by others. We now receive from Messrs. Holmes a bottle of a similar preparation, which is to be sold under the name of Holmes' Photographic Ozone. Our readers no doubt understand that by shaking the ordinary "chloride of lime," or "bleaching powder," with six or eight parts of water, and filtering, a solution can be prepared which will serve the same purpose, although it is often more convenient to work with the alkaline hypochlorite.

Steeplechasers Photographed.—This has been very successfully done by Chas. Knight, of Newport, Isle of Wight. A group of three riders—one just over the hurdles, another on the point of taking the leap, and a third just clear—is notably striking.

The Atomic Weight of Gold.—This important constant has been re-determined by T. E. Thorpe and A. P. Laurie, the salt employed in determining being the double bromide of gold and potassium, a combination which crystallises well; the gold and bromine in this both being estimated. The method of analysis was as follows:—About 15 grams of the double salt was introduced into a large porcelain crucible, carefully dried in an air-bath, and then decomposed by heating over a Bunsen flame. The crucible containing the mass of decomposed salt was weighed against a similar and similarly treated crucible, the bromide of potassium washed out with hot water, the solution being drawn into a bottle by reverse filtration, and the gold ignited in a muffle, and again weighed. From these weighings the first set of values for the atomic weight was calculated. A weighed quantity of silver (the purity of which had been tested at the Mint by comparison with the trial plate) was dissolved in dilute nitric acid and added to the potassium bromide, and the excess of the potassium bromide precipitated by a solution of silver nitrate of known strength. From these results the second series of values was calculated. The silver bromide was then collected, dried at 160° C., and weighed. From these weighings a third series of values was calculated. The mean value obtained for Au as the result of twenty-five experiments was 196·850, the maximum variation being within limits corresponding to 0·034.

THE JUBILEE EXHIBITION AT MANCHESTER: EXTRAORDINARY PROCEEDINGS.—The disreputable expedient of a "Press Dinner" resorted to by the management of the Jubilee Exhibition at Manchester has been accompanied by the issue to the press of a long printed notice in leader form describing in the present or past tense the things intended to be brought about, and crowded with the most fulsome praise of the arrangements made by the committee issuing the document. We quote a few phrases from the matter thus officially offered ready-made to the papers:—"*So good are the architectural proportions, and so admirable is the arrangement of the buildings, that,*" &c., &c. "*It was, therefore, a happy thought which led the committee to,*" &c., &c. "*It was a peculiarly happy impulse which prompted the Exhibition committee,*" &c, &c. "*Without entering into any details, we may safely assert that this is the most complete and comprehensive exhibition of industrial machinery that has ever been collected.*" "*Wisely recognizing the necessity of catering for the popular taste, as well as of supplying instruction and the more solid attraction of mechanical, industrial, and other exhibits, the committee created a special department of music, horticulture, and electricity, and a variety of attractions will be supplied which may be roughly grouped under one or other of above headings.*" The last sentence is certainly a magnificent euphemism to express that the Cremorne element will be introduced, and the sentence before it indicates that at the time the document was concocted the committee possessed very few details to enter into. Regarding the fine art section—a complete chaos at the time the notice was sent round to the press—we have their officially-presented notice, which strikes us as the sort of unmeaning stuff which would be written by one who wants to say something flattering of an exhibition before he has the least notion what will be in it. Here is the conclusion thereof:—"*Of the merits of the paintings, sculptures, engravings, etchings, and woodcuts included in it, it would be impertinent as it is superfluous to speak. The arrangement of the thirteen large galleries into which the section is divided, the lighting of them both by day and night, the precautions which have been taken to secure the valuable contents from injury by fire or damp, the hanging of the pictures, the disposition of the statuary, and the catalogue, which is full of interesting reading, as well as being a useful guide—all these features combine, with the unequalled merits of the works of art themselves, to render the Fine Art section the most attractive part of the Exhibition, and one which, by itself alone, will make a visit to Manchester in 1887 a most delightful memorial of the Queen's Jubilee.*" There is a photographic department, in which the historical side is at present badly represented, and in which the commercialist photographer, photo-retoucher, and photo-patchworkist of the present time are accommodated with a disproportionate amount of space. Should such additions be made as to give the collection much general interest, we shall give a further notice.

H. J. BURTON'S MACHINE FOR COATING GELATINO-BROMIDE PLATES.—The following description is given in *Autotype Notes* by Mr. Burton:—"The bed of the machine is formed of two pieces of straight sound pine, placed edgeways, and the whole six feet long; two raised strips screwed on to this bed run the whole length; these are grooved to take two travelling gut bands, which carry the plates; there is a double grooved roller at each end, one roller being adjustable to get the necessary tension upon the bands. At one end of the bed is fixed an inclined plane, upon which the plates are placed, and from which they descend by the operation of gravity to the travelling gut bands as the machine is worked; these bands carry them on to the coating trough. Guides are provided for the plates as far as the coating trough, which is placed about the middle, and at right angles over the bed of the machine. The motion is given by a small crank wheel at one end of a shaft, and a heavy fly wheel at the other, and pulleys arranged to give a steady slow motion, when the crank is rather quickly rotated. The trough is of metal, electro-plated, and is made V-shape, one side of the V being hinged to a crossbar. At the other side of the trough, and near the lower edge, is a row of small holes, through which the emulsion flows; a piece of metal is attached at an angle to the lower edge of the trough, and forms an inclined plane; at the lowest edge of this inclined plane a piece of fine muslin is attached; in this the emulsion collects, as it runs from the holes down the inclined plane, and filters itself in passing through the muslin on to the plates as they travel forwards. The trough is made to hold but very little emulsion, and is supplied by an inverted bottle and tube, the tube dipping into the trough so that the supply is kept up till the whole of the emulsion is used. Under the inclined plane two silver guides are provided, for the purpose of lifting the trough to suit glass of varying thicknesses, and also to keep the lower edge at a proper distance from the plate as the emulsion flows out; this machine has been found to answer admirably in practice; a large batch of emulsion can be used right off in about an hour and a half, thus doing away with many difficulties, including the serious one of very sensitive emulsions changing their character between the beginning and the end of the coating, when the latter operation took some hours, as in the old method of hand-coating.

PHOTOGRAPHIC CLUB.—The subject for discussion on May 11 will be "Camera Stands." Outing on Saturday at Twickenham; meet at Twickenham Railway Station as near to 2·30 as possible.

To Correspondents.

•*• We cannot undertake to return rejected communications.

•*• Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

H. C. F.—1. Ordinarily an uncorrected lens which is combined when a reflecting prism is used—or, rather, a reflecting prism in which the non-reflecting faces are worked to suitable curves. Quite third-rate optical work will answer, and very likely you can get the lens, head, and turning gear at a moderate price from Negretti and Zambra; or Newton, of Fleet Street. 2. Probably the reflecting prism will be more convenient than a mirror. Write again if you cannot get what you want at one of the places mentioned.

E. WALKER.—If the letter we have sent you by post is not sufficiently detailed, write again.

GREENWOOD PIM.—1. Your letter was not inserted because we did not receive it. 2. If you write to the Editor about advertisements, there will certainly be delay.

T. B.—1. Use moist water colour. 2. Probably lighted too much from the front. 3. Print more deeply, and tone for a longer time.

E. W. L.—Particulars will be found on page 162 of the current YEAR-BOOK. (The article commences on page 161.)

H. P.—A very good one is that invented by Addenbrooke, and sold by Watson, of Holborn.

SUN PRINTING.—Try making the solutions stronger, and use a harder paper. There is more difference between the two samples when viewed by reflected light than when examined by transmitted light. In your case the solution has penetrated too far. The addition of a little gum may also be useful in keeping the preparation to the surface. Write again, and let us know how you get on.

THOS. CONSIN.—1. Use less alcohol, and mix it in gradually.

C. R. S.—See answer to H. C. F., who enquires after the same article you want. As regards the possibility of hiring, we can say nothing; but if you only require it for use on one occasion, you may perhaps make use of a long focus portrait lens set vertically, and a mirror mounted at an angle of 45° over it. The mirror must be so mounted that it can be turned round, and it will make no difference whether the lens is turned round with the mirror or not.

W. M. A.—We have written to you on the subject.

H. T. & W.—We have not seen it; when and how was it forwarded?

W. H. BANKS.—1. The surfaces of the colour screens must be optically worked, and they are sold by Steinheil for use with his lenses. Possibly you may find them in stock at the store of Negretti and Zambra, who are agents for Steinheil, or you can have them made to order by any optician. 2. Aperture and other conditions being equal, more light passes when the shutter is in the position of the diaphragm than when placed in front. 3. Not in a real amateur exhibition; but in a shop under this name we expect it would be allowed.

AMATEUR EXHIBITOR.—Thank you for the enclosure giving particulars of the undertaking; but we cannot give you an absolutely certain answer to your question. The notice says that all enquiries will receive prompt attention, so all you have to do is to write and ask whether the person appointed as judge is in the employment of the firm.

A SILVER PARTICLE.—1. Apply at the office, Burlington House. 2. Only by advertising for them. 3. Because it was regarded as sulphate, in which one atom of oxygen is replaced by sulphur.

THE PHOTOGRAPHIC NEWS.

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AMMONIA FUMING FOR READY SENSITISED PAPER.

It has frequently been observed as a curious thing, that in the department of photography in which the largest amount of work is daily performed—silver printing upon albumenised paper—there should be such a difference in practice as that which exists between the greater part of the workers in the United States of America, who, as a regular thing, fume their sensitive paper with ammonia before using it, and those practising in this country, where the fuming process is comparatively but little employed. Beyond remarking that the higher temperature and greater dryness of the air prevailing during a considerable portion of the year in the western continent, as compared with our own land, may conduce to render the process of ammoniacal fuming, in order to obtain the best results, more necessary there than here, we do not propose, in the present instance, to go into the general question of the desirability of fuming paper that is sensitised in the usual way by the photographer himself, but confine ourselves to the application of the process to paper which is supplied commercially in the ready sensitised condition.

It appears to be commonly assumed that sensitised paper as sold by the manufacturer is in the most perfect condition without further treatment. And undoubtedly, the results sometimes obtained upon it just as supplied are so satisfactory that there is no inducement to do anything else than to use it as sent out. But this is not by any means invariably the case, and it is when another state of things is found to exist, or when the paper has, by a little keeping—without becoming discoloured—yet lost the quality it originally possessed of yielding prints rich in tone that a method becomes desirable, by means of which this quality may be obtained if originally lacking, or regained if lost.

One of the main inducements to use paper sold as ready sensitised is the fact that the troublesome process of floating the paper upon the silver bath is saved to the photographer, and some have considered that if it were necessary to fume ready-sensitised paper, this necessity would counterbalance the advantage of not having to float it. The difference of trouble in the two operations is, however, considerable; besides this there is the benefit of doing away with silver-stained fingers, and the accessory inconvenience of large dishes and appliances necessary where sensitising has to be done, especially if only occasionally required.

A process, early published as one for preparing sensitised paper, was that in which an acid in rather large quantity—citric acid was generally recommended—was added to the silver bath. It was, however, recognised that paper thus prepared would only tone with difficulty, and not in a satisfactory manner, unless it was fumed with ammonia before printing. Paper put upon the market is prepared in such a way that it will yield far superior results as it is, without fuming, to those obtained with the acid unfumed paper, of which we have just spoken; but still it not unfrequently happens that ready-sensitised paper is so much improved by ammoniacal treatment, that although we have before this called the attention of our readers to the advantages to be gained by the use of the plan, we think it desirable again to refer to it.

In one instance which recently came under our notice a whole day's prints were weak, and refused to tone to any satisfactory colour, and this although paper from the same parcel had but a few days before worked well. It proved that the weak prints were printed upon nearly the last few sheets of the parcel, and that they had been left cut up for use in the printing room from Saturday to Monday. The intervening day had been warm, and in the printing room with the sun upon it, and the sashes all closed, the temperature must have been rather like that of a hot-house. The prints produced upon the paper thus kept, though only for forty hours or so, were miserably poor, so much so that the whole batch was rejected. We suggested fuming what was left of the paper, and its quality appeared to be restored to at least as high a standard as that possessed by it originally.

In another case a fresh batch of paper, supplied by the same house from which very satisfactory paper had previously been received, printed almost as badly as that to which we have referred as having been injuriously affected by heat. In this case also, fuming with ammonia effected a change of the most satisfactory character, the paper printing with richness and toning well. We may add that we found on experiment with these papers that they required a longer exposure to ammoniacal vapour than is generally recommended for ordinary albumenised paper, and that they would stand it without injury; some pieces indeed, that were left for as long as six or eight hours in the fuming box, printed well, the slight discolouration that had occurred from this prolonged treatment almost entirely disappearing during the subsequent processes of toning and fixing.

An objection formerly existed to the use of ammonia, where the printing room was not separate from that part of the establishment devoted to dark-room operations, on account of the tendency of ammonia vapour to produce a fogging action of the silver bath. Now that gelatine has taken the place of collodion, this objection no longer holds good; but, on the other hand, the question of the effect of ammoniacal gas upon the health has been raised, and proper precautions should be taken, where ammonia fuming is largely or frequently adopted, in order to prevent the fumes from affecting the printer. The fuming box should close as nearly hermetically as may be, and provision made for ventilating the place where it is in use. In conclusion, we would unhesitatingly advise that when printing on ready-sensitized paper does not prove satisfactory, the fuming remedy should at least have a trial.

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NEWCASTLE-ON-TYNE INDUSTRIAL EXHIBITION.

Competitive Section of the Photographic Association.—Judges' Awards.

Series of Six Portraits (Class 1).—J. Lafayette, Dublin, gold medal, for 35 to 40; H. S. Mendelssohn, London, silver medal, for 10 to 13, and 31, 32; Werner and Son, Dublin, special mention, for 15 to 18.

Series of Six Landscapes (Class 2).—H. Tolley, Nottingham, gold medal, for 225, 227, 228, 63, 87; Paul Lange, Liverpool, silver medal, 236, 266; J. P. Gibson, Hexham, special bronze medal, 127, 129, 130, 140, 141, 143; F. M. Sutcliffe, Whitby, special mention, 54.

Single Landscape or Marine (Class 3).—H. R. Proctor, Tynemouth, silver medal, for 278 (landscape); J. Pike, Newcastle, special bronze medal, for 113 (marine).

Figure (Class 4).—F. M. Sutcliffe, Whitby, silver medal, for 52.

Genre (Class 5).—F. M. Sutcliffe, Whitby, silver medal, for 256; A. Diston, Leven, Fife, special mention, for 137; A. Donald, Dundee, special mention, for 174.

Ceramic Enamels (Class 6).—P. M. Laws, Newcastle, silver medal, for 117 (only exhibit).

Enlargements (Class 7).—M. Auty, Tynemouth, silver medal, for 198; J. H. T. Ellerbeck, Liverpool, bronze medal, for 7.

Instantaneous (Class 8).—Symonds, silver medal, for 21; West and Son, Gosport, silver medal, for 145; E. W. Alabone, London, bronze medal, for 22.

Architectural (Class 9).—J. Pike, Newcastle, silver medal, for 154.

Interiors (Class 10).—W. Parry, South Shields, silver medal, for 108.

Mechanical Processes (Class 11).—P. M. Laws and Son, silver medal.

Amateur photographer's medal (Class 12).—P. Lange.

The judges say:—"We consider that 'The Smithy,' 137, by Adam Diston, is worthy of special mention, and that it should be awarded one of the medals we have been unable to place.

"We take the opportunity of pronouncing our decision to recommend to the attention of photographers two points as objects of their pursuits:—To make photographs of old buildings before they pass into decay, and to avoid introducing figures where they detract from good pictorial effect."

Special bronze medal to A. Diston awarded by the Council on the recommendation of judges.

As it is intended to issue an illustrated catalogue, prize winners are requested to send as early as possible prints of their pictures for selection and reproduction. They should be sent as soon as possible to Mr. J. Pike, hon. sec., 16, New Bridge Street, Newcastle-on-Tyne. Some little delay will necessarily occur in the issue of the catalogue, but a copy will be sent, when ready, to each exhibitor.

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PRACTICAL LITHOGRAPHY IN HALF-TONE.

BY J. HUSBAND, SERGT-MAJOR, R.E.*

Description of Husband's Papyrotint Process.—This process has been named papyrotint, being a modification of Captain Abney's improved method of photo-lithography, named papyrotype. It is specially adapted for the reproduction of subjects in half-tone, such as architectural drawings in monochrome, or subjects from nature, and it is inexpensive. Its advantages over other methods of half-tone photo-lithography are, that a transfer can be taken in greasy ink, for transfer to stone or zinc, *direct* from any negative, however large, without the aid of a medium, the grain or reticulation being obtained simply by a chemical change. The transfer paper being in direct contact with the negative, the resulting prints are sharper than by those processes where interposed media are used; whilst the same negative will answer either for a silver print, platinotype, or a transfer for zinc or stone. The advantage of being able to use a non-reversed negative is very great, now that gelatine plates have so largely superseded those made with collodion.

The method of manipulation is as follows:—Any good surfaced paper is floated on a bath composed of—

Gelatine (Nelson's flake)	8	ounces
Glycerine	1½	,,
Chloride of sodium (common salt) ...	2	,,
Water	50	,,

Great care should be taken that the solution is not over-heated, and that the paper is coated without bubbles. It is then dried in a temperature of 60° Fahr. The paper will take about ten hours to dry, and in this state will keep for years. When required for use, it should be sensitized by floating, or immersing, in a bath of—

Bichromate of potash	1	ounce
Chloride of sodium	½	,,
Ferricyanide of potassium	100	grains
Water	30	ounces

This need not be done in the dark-room, as the solution is not sensitive to light.

The paper, after sensitizing, is dried in a temperatue of 70°, and in a dark room. When dry, it is exposed under any half-tone negative, in the ordinary printing frame. It is preferable to print in sunlight, and, for negatives of medium density, an exposure of three minutes is required; but the exposure will vary according to the density of the negative. The correct time of exposure can best be judged by looking at the print in the frame. When the image appears on the transfer paper a dark fawn colour on a yellow ground, the transfer is sufficiently printed. It is put into a bath of cold water for about ten minutes, until the soluble gelatine has taken up its full quantity of water; then taken out, placed on a flat piece of stone, glass, or zinc-plate, and the surface dried with blotting-paper.

The action of the light has been to render the parts to which it has penetrated through the negative partly insoluble, and, at the same time, granulated. A hard transfer ink is now used, composed of—

White virgin wax...	½	ounce
Stearine	½	,,
Common resin	½	,,

These are melted together in a crucible over a small gas jet, and to them are added 4 ounces of chalk printing ink, and the mixture reduced to the consistency of cream with spirits of turpentine. A soft sponge is saturated with this mixture, and rubbed gently over the exposed paper (in this stage the nature of the grain can be best seen). An ordinary letter-press roller, charged with a little ink from the inking slab, is then passed over the transfer, causing the ink to adhere firmly to the parts affected by the light, and removing it from the parts unacted upon. It will be found that with practice, rolling slowly and carefully as a letter-press printer would his forme, the ink will be removed by the roller according to the action that has taken place by light, leaving the shadows fully charged with ink, and the high lights almost clear, the result being a grained transfer in greasy ink. The transfer is next put into a weak bath of tannin and bichromate of potash for a few minutes, and when taken out the surplus solution should be carefully dried off between clean sheets of blotting paper. The transfer is hung up to dry, and, when thoroughly dry, the whole of the still sensitive surface should be exposed to light for about two minutes. A weak solution of oxalic acid should be used for damping the transfer (about 1 in 100), and this should be applied to the back of the transfer with a soft sponge. After it has been damped about four times, it should be carefully put between clean sheets of blotting-paper, and the surplus moisture removed. A cold polished stone is then set in the press, and after everything is ready the transfer is placed on the stone and pulled through twice. The stone or scraper is then reversed, and the transfer is again twice pulled through. A moderate pressure and a hard backing sheet should be used, care being taken not to increase the pressure after the first pull through. The transfer is taken from the stone without damping, when it will be found that the ink has left the paper clean. Gum up the stone in the usual way, but if possible let the transfer remain a few hours before rolling up. Do not wash it out with turpentine, and use middle varnish to thin down the ink.

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* From the Journal of the Photographic Society.

It should have been mentioned that varying degrees of fineness of grain can be given to the transfer by adding a little more ferricyanide of potassium in the sensitising solution, and drying the transfer paper at a higher temperature, or by heating the paper a little before exposure, or by adding a little hot water to the cold water bath, after the transfer has been fully exposed; the higher the temperature of the water the coarser the grain will be. The finer grain is best suited to negatives from Nature, when a considerable amount of detail has to be shown.

The coarse grain is best for subjects in monochrome, or large negatives from Nature, of architecture, &c., where the detail is not so small. Even from the finer grain several hundred copies can be pulled, as many as 12,000 having been pulled from a single transfer, and this one would have produced a great many more if required.

ON DALLMEYER'S PROPOSED ALTERATION OF THE STANDARDS FOR LENSES.

BY JAMES CADETT.*

It must not be expected that I have anything new to bring before the meeting to-night, as the subject of my paper has been pretty vigorously discussed during the last month in the Photographic News. I think, however, that it is of sufficient importance to receive the serious consideration of this Society. The name of Dallmeyer will command attention to any suggestion concerning that important part of photographic apparatus, the lens, and I need scarcely, therefore, say that we ought to give every attention to anything coming from one of such large experience as Mr. Dallmeyer. I had the honour to be one of the Committee appointed by the Council of this Society to consider and report upon the best means of attaining uniformity in the construction of apertures, in the diaphragms of lenses, flanges, and camera screws. I naturally, therefore, feel great interest in anything bearing on this matter.

The credit of getting a committee together to arrange standards for photographic lenses is, I believe, due to the efforts of Mr. Warnerke. If my memory serves me rightly, he originally proposed $\frac{f}{2}$ as the unit for our standard apertures; but we found that numbers representing the relative exposures for small apertures became inconveniently high, and in consequence $\frac{f}{4}$ was chosen. Moreover, if I remember rightly, the impression was general that $\frac{f}{4}$ represented the approximate full aperture of the ordinary Petzval portrait lens. At any rate, I myself was under that impression; and lenses of this description being in very general use, we thought $\frac{f}{4}$ would be a very good unit to start from. No doubt it is so, but the question now arises—Can we have a better unit? We are told by a very high authority that we can, and therefore, without prejudice, with a desire for progress, and with that element of conservatism to preserve that which is good, we ought to logically consider the question.

Mr. Dallmeyer wishes us to change our standard from $\frac{f}{4}$ to $\sqrt{\frac{f}{10}}$. To those few who do not quite grasp the difference, I might say that, supposing the present standard aperture required 16 seconds' exposure, Mr. Dallmeyer's standard would require 10 seconds, and would be thus a considerably quicker lens.

Mr. Dallmeyer's reason for the suggested alteration is that the standard numbers would then become a factor of the squares of the denominators of the fraction expressing intensity; in fact, identical, except in the position of the decimal point. Moreover, the system would be a decimal one. There may be a few who would like this more clearly explained. I will therefore, at the risk of being tedious and rather simple, try to explain what is meant as clearly as possible. The present standard aperture is $\frac{f}{4}$. Mr. Dallmeyer's proposed standard is $\sqrt{\frac{f}{10}}$ or $\frac{f}{3{\cdot}162}$, &c.

Now, of course, when we want to compare the relative exposures of various apertures, we know that they are proportional to the squares of the denominators of the fractions representing the respective intensities. For example, to compare $\frac{f}{4}$, the Photographic Society's standard, with $\frac{f}{8}$, the full aperture of the rapid rectilinear, we square the denominators, which become respectively 16 and 64. Now, if we let the 16 represent unity, we must divide the 64 by the 16, to express the relative exposure of the $\frac{f}{8}$ in the terms of that unit; 16 becomes our divisor, and, as it goes 4 times, we say that $\frac{f}{8}$ requires 4 times the exposure of $\frac{f}{4}$; $\frac{f}{8}$ is therefore No. 4 in terms of the standard.

Now, with Mr. Dallmeyer's standard, as soon as we want to express any fraction of inteneity in terms of his standard, 10 becomes our divisor, because we start with $\sqrt{\frac{f}{10}}$. To square the $\sqrt{10}$ simply means 10, and 10 is, of course, a much more simple divisor than 16. Comparing $\frac{f}{8}$ with $\frac{f}{\sqrt{10}}$ we square the 8 as before, and then divide the result 64 by 10, which almost every one knows simply means putting a decimal point in, and we get 6·4 as representing $\frac{f}{8}$ in terms of Mr. Dallmeyer's standard. Inversely, if we want to know the fraction of intensity represented by apertures already expressed in terms of the unit, we must multiply such apertures by the unit divisor, and then the square root of this result will give the denominator of such fraction, thus taking No. 4 P. S.

Denominator of intensity fraction $= \sqrt{16 \times 4} = 8 \therefore$ Intensity of fraction $= \frac{f}{8}$.

Taking Dallmeyer's standard—

Denominator $= \sqrt{10 \times 6{\cdot}4} = 8 \therefore$ Intensity fraction $= \frac{f}{8}$.

So far I have taken an intensity fraction favourable to the Photographic Society's staudard, as it makes a complete number, and one would say that, for trouble of calculations, there is not much to choose: but when we come to small apertures, I think it will be generally admitted that Mr. Dallmeyer's standard gives less trouble, because as soon as we get the square of the denominator the standard terms are visible at once, without further trouble. For instance, let us take $\frac{f}{26}$ (the fourth stop of a 12×10 Dallmeyer rapid rectilinear).

Squaring, we have 676, and to get the terms of the Dallmeyer unit we have simply to point off the 6, giving 67·6 as the standard relative exposure. With the P. S. standard, we must divide by 16, and then we get 42·25, the same relative exposure in terms of the P. S. standard.

Now, having explained the nature of the P. S. standard and Mr. Dallmeyer's proposed standard, let us try and see what advantages and disadvantages pertain to both respectively. But, first of all, let me say a word as to the claims of both with regard to being a standard of unity, representing the intensity of the ordinary quick-acting studio lenses. There has been a rather warm discussion on this point for both standards; why, I do not know, for I do not see that it matters at all which is right.

For instance, of what use is it to tell a landscape photographer who is using $\frac{f}{8}$ to $\frac{f}{40}$ that in a studio (we cannot define the lighting, aspect, surroundings, whether the glass of the studio is dirty or clean, and a host of other things affecting exposure) $\frac{f}{4}$ requires one second? Is there any man here rash enough that could venture to name the landscape exposure from the data of studio lenses? And the very studio photographer himself—what cares he whether his lens is $\frac{f}{4}$ or $\frac{f}{3·162}$, &c., so long as he knows the comparative exposures required by the diaphragms belonging to his lens? It does not matter what the standards may exactly be, so long as we have a standard to enable various lenses to be used with a tolerable amount of certainty under similar conditions, and I am rather surprised that so much should have been made of this point. Besides, considering the enormous number of lenses of the "B" portrait series sent out by the firm of Dallmeyer, the intensity of about $\frac{f}{3}$ must be pretty general. At any rate, I think this point may fairly be dismissed from the argument,

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* Read before the Photographic Society of Great Britain.

We will now sum up the advantages and disadvantages of Mr. Dallmeyer's standard.

Advantages.

1. The relative exposures, as shown by the squares of the denominators of the intensity fraction, are with a glance converted into the standard terms.

2. The system is a decimal one, and as long as the base of notation universally remains 10, it is more scientific to adopt a decimal system, where it can be done with advantage.

Disadvantages.

1. The numbers run higher, in representing small apertures, than P. S. standards, in the proportion of 16 to 10. At first sight I was inclined to include as a disadvantage the point raised by Mr. Debenham, that, to obtain the diameter of an aperture representing unity on the Dallmeyer standard, the focal length must be divided by the awkward figure 3·162, &c. I think I can presently show that this objection does not hold good. The advantage of the P. S. standard over Dallmeyer's standard is, that the numbers representing the relative exposures in terms of the standard are lower.

2. The numbers representing respective exposures have to be divided by 16, and this cannot always be done at a glance.

Now, looking at both standards fairly, I must say that I think Mr. Dallmeyer's standard certainly offers an advantage over the present one.

I think, therefore, we ought to adopt it. The pith of its advantage lies in the division by 10 instead of 16. It saves just half the trouble, as in any case we must square the denominators. There the trouble ends with Mr. Dallmeyer's standard, for we cannot count division by 10 as anything; but with the other we have 16 to divide by—not very serious, but still there it is.

Besides, though it is well known that many scientific men deplore the fact that the universal notation is based on 10; yet, while that fact remains, I think we ought to base our calculations on as much a decimal system as possible. Now we come to the disadvantage of the higher numbers in Dallmeyer's system. I think, after consideration, that this disadvantage is not equal to the advantage; in fact, the difference is not great enough to have any practical effect. I will now say a word on the objection raised by Mr. Debenham. I think he has forgotten that there is only one case where divison by $\sqrt{10}$ is necessary. It is, as he points out, when an aperture is required representing the unit value itself. In no other case does the division by 3·162, &c., really occur. Besides, how rarely in these days of rapid plates we meet with a lens that would permit an aperture of the unit value, even supposing that we cared to do the optician's work and make our own unit diaphragm. Surely it does not need argument to say that the general and easy comparison of relative exposures is the point we wish to obtain, and not the making of one diaphragm of the unit value. I say one diaphragm, for in no other case does 3·162 become the divisor. We must bear in mind that any lens under the rapidity of the unit stop would not permit a unit stop to be made for it; besides, it is doing the work of the lens manufacturer to make diaphragms, and does not come under the general comparison of lenses. Once we leave unity, both systems are pretty well equally troublesome, supposing we want to make a diaphragm for No. 2 in each standard respectively. For P. S. standard we have $\sqrt{16 \times 2} = 5·65$, &c. Intensity fraction $\frac{f}{5·65}$, &c. For Dallmeyer's standard we have $\sqrt{10 \times 2} = 4·47$, &c. Intensity fraction $\frac{f}{4·47}$, &c. There does not seem much to choose here. In the P. S. standard we shall get whole numbers, in making diaphragms for relative exposures represented in terms of the standard by 1, 4, 16, 64, &c., as the result, extracting the square root; but as calculations are so rarely made by the photographer in this respect, it is not worth consideration.

There is another point which must not be forgotten by those who wish to make their own diaphragms; it is that in double combination lenses the diameter of the diaphragm is not the measure of the actual pencil of light transmitted by the lens, and therefore it requires an optician's knowledge to make diaphragms accurately to a given intensity.

Diaphragm making is not common amongst photographers, nor will it ever be so while we can leave this matter to those who best understand it. I think I have shown that for diaphgram making there is really nothing to choose between both standards. Should any one not think so I shall be very pleased to refer to this point during discussion. On the whole, then, I am myself in favour of altering the standard, but I hope that others more experienced than myself will discuss the matter thoroughly.

It is of course to the opticians we must look for the greatest advantages to be derived from a standard unit for relative exposure. If they would only co-operate we ought to have all the numbers in terms of the unit without a single decimal figure to mar the simplicity. I am not optician enough to say if this could be done absolutely, but practically I think it might be so. We had good evidence, from experienced men on the late Committee, that for all practical purposes diaphragms giving a relative exposure of twice the next largest aperture were sufficiently close. It follows from this that if we start from a standard unit the only intensities that ought to exist at all would be represented in terms of the standard by 1, 2, 4, 8, 16, and so on; and lenses having a full aperture of less rapidity than the standard should have their full apertures represented by one of the series just mentioned. Were all lenses so made, they would all be comparable with each other at a glance. By simply dividing any of the standard terms into each other—the smaller into the greater—we should at once, in definite and simple figures, see the comparative exposures required.

In conclusion, I trust that this matter will receive attention from this Society, and be discussed on all its points.

CARBON PRINTING: EXPLICIT INSTRUCTIONS FOR PROFESSIONAL AND AMATEUR PHOTOGRAPHERS.

BY MAX BOLTE.

[Reprinted from *Anthony's Bulletin.*]

Introduction.

Of all materials known to chemistry, carbon is the most constant and resistent to the influences of temperature and the hygrometric changes of the atmosphere. Looking at old manuscripts, or old engravings, which were produced by writing or printing in carbon, we always find that the black characters and lines remain black, even if centuries have passed over them, the paper, parchment, or other supporting materials meanwhile having faded or become yellow. Carbon having been employed as the essential colouring matter in all these, it has proved to be the desideratum for the production of photographic pictures. Even if the printing processes with silver salts have advanced much, it is well known that pictures produced in this way (and having been made with the utmost care) generally fade more or less in the course of years, even if they are protected against the light.

The strain laid upon photographers in consequence of competition often, unfortunately, causes them not to be so careful and cautious as they ought and would like to be in the production of pictures; and, owing to these and other circumstances, it only too often happens that silver prints made by them sooner or later show signs of alteration. This is due to lack of care, to which they had to consent in order to make their business pay. Of course this is not always the case, for there are, fortunately, many photographers who, by their merits and conscientiousness, are in such a position as to be able to devote all their time and a special carefulness to the production of as really good and permanent work as possible, in order to maintain the high standing which they have been able to reach through their ability and the artistic class of work they turn out.

Now, as regards the carbon process there is the great truth which predominates over all—viz., that carbon pictures produced in the way already described by many authors, and practised by a great number of well-known photographers and amateurs, are stable and not subject to any such influences as are dangerous to silver prints. There has often been made the apparently just remark by those who do not know the carbon process, that it is a so-called "blind" process, *i. e.*, it is in some way guesswork, or a process where the watching of the impression produced by the light on the sensible pigment cannot be seen, controlled, and modified. It has farther been objected to this beautiful and interesting process, that it is too delicate, and claims too much care and constant precautions in order to produce good prints.

But all these objections are made in a somewhat rash and inconsiderate manner, for science and intelligence have given us an auxiliary which, as far as caution and carefulness come into co-operation, supplies us with a contrivance more perspicacious than our own eye would be; the photometer or actinometer, which was invented expressly for this purpose. By means of this little contrivance, carbon printing is rendered really easy, and the worker readily becomes acquainted with its use, and soon acquires a security which, in fact, is surprising.

As far as precautions and carefulness are concerned, it is evident that any such process will claim its just portion; but considering that the silver printing process also claims them (the repeated washings of the prints, the gold toning bath, the elimination of the hypo, &c.), it is evident that the balance inclines towards the carbon process, so long as really permanent prints are desired.

The carbon process since it was invented has always been an interesting subject to scientific men, and when we look over its history we find the names of Poitevin, Regnault, Sutton, John Pouncy, Fargier, Swan, I. R. Johnson, Leon Vidal, Dr. Van Monckhoven, Bolas, Woodbury, Dr. Liesegang, and others, who have all worked and made improvements upon it. Several treatises have been published, all containing valuable formula and recommendations, but very few are written in such a detailed way as to enable a person to take up the carbon process and, book in hand, make it a success. The principal object of the present treatise is to enable a person to become a carbon printer, and special care has been taken to give all the instructions as clearly as possible; giving the formulas for the sensitizing baths, solutions, &c., plain and intelligible, in order to avoid to the utmost the chances of a bad result; and it is hoped in a manner that will enable any careful worker to follow up this process with not more trouble than attaches to any work of a simliar kind.

Work-rooms.

A dark room (yellow glass windows or yellow artificial light are sufficient) must be provided wherein to sensitize the carbon paper, and special care must be taken that it is well ventilated, and not in too close proximity to a kitchen, stable, or water-closet. It is also necessary that it is a dry room, and that the floor be clean and not covered with a carpet. The screens for keeping off the actinic light by preference to be of dark smoked orange glass, combined with yellow (sunflower-colour) tissue paper when it is the intention to sensitise during the day-time. However, as will be seen in the Chapter on Sensitising, it is not absolutely necessary to sensitise during the day, and it is even more convenient to do it in the evening, when a simple sperm candle is all that is wanted to conduct these operations.

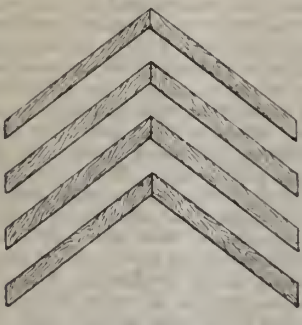

Fig. 1.

For the production of large quantities of carbon prints on a large scale, there should be a dark room as described above. The late Dr. Van Monckhoven recommended a special contrivance, which at the same time gives a good and abundant light with perfect and convenient ventilation. It consists of double shutters, as in Fig 1, painted inside and out with a yellow colour, and having the angle uppermost. A window may be fitted to receive it. Mr. Sarony, of Scarborough, England, uses a very convenient arrangement, which will be easily understood by Fig. 2.

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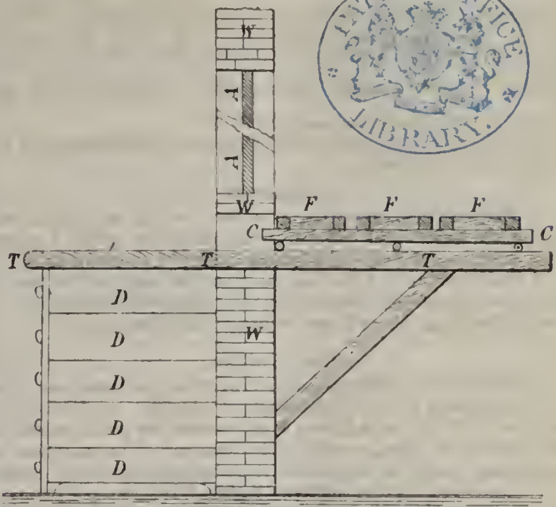

Fig. 2.

The rooms for development, mounting, and retouching do not claim any special preparations as regards light, for all these operations are conducted in daylight. There should, however, be provided communications with the main water-pipe and sink. It is good if the floor is covered with asphaltum, or has stone paving.

For amateurs these contrivances are not necessary, or should be greatly modified. The greater number are possessed of a dark room, and will easily be able to make such alterations as will be indicated hereafter. The above recommendations as regards light, ventilation, proximity of kitchens, stables, or water-closets, &c., must be borne in mind. Those who do not possess a dark room will also be able to make carbon prints if they follow the indications given in the following pages.

Apparatus.

Trays.—Four different classes of trays are wanted: for sensitizing, a reservoir tray, developing, and alum bath. Their size depends upon that of the plates used and the dimensions of the pictures desired. For 8 by 10 plates the dimensions of the trays ought to be as follows: Length, 11½ to 12 inches; breadth, 9½ to 10 inches; depth, 5 to 6 inches. For sensitizing and developing, same length and breadth, but at least 10½ inches deep for the reservoir tray, and only 2 to 2½ inches for the alum bath. The 8 by 10 size for plates is very convenient, for it allows that two 5 by 8 or smaller sized pictures can be developed at the same time, thus simplifying the work very much. These trays should be made of stout sheet zinc, not of tinned iron. It is also very convenient to procure one larger tray, two to three inches longer and broader, and to use it, when the temperature in summer rises above 70 to 75 degrees F., as a cooling-bath for the sensitizing and transfer manipulations. If convenient, all these trays may be coated with a varnish made of asphaltum in benzine; however, it is not necessary.

Squeegee.—There should be at least two squeegees. They can be obtained ready made and of different sizes. It is easy to make them by proceeding as follows:—Take a piece of wood,

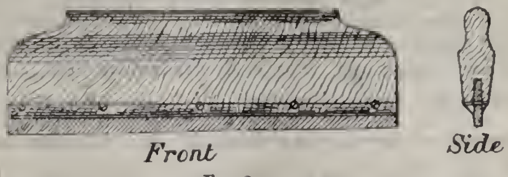

Fig. 3.

say 8 by 3 by ¾ inches, and give it the form as in Fig. 3. Make a groove at the lower end, and place into it a piece of rubber-cloth, three or four-ply, the same length as the wood and about two inches in breadth; secure by means of some brass screws. Larger plates than 10 by 12 claim a squeegee of larger size. Mark one of them with a *B* and the other with a *T*, and use *B* only for the sensitizing of the paper, and *T* for the transfers, as will be explained later on.

India-rubber Cloth.—Two pieces of this cloth should be provided. As regards size, they must be at least three inches larger every way than the plates for which they will be used. They must be kept clean, and it is best to use one for the sensitizing and provide it with a mark, say *B*, and reserve the other for the transfer, marking it *T*.

Folding Racks.—There should be three. They are cheap, and can be obtained from any dealer in photographic materials.

Glass or Porcelain Plates.—These plates must be chosen according to the size of the pictures to be produced. It is also left open to decide whether ground or plain plates be used. Plain plates, glass or porcelain, produce pictures (by means of the double transfer) with a high gloss; ground plates give a matt surface. Beginners will do better in employing porcelain plates, which render it more easy to estimate the strength of the picture when developing. Large pictures, also transparencies, claim glass plates, for there is a difficulty to obtain large porcelain plates free from defects, and their cost is exceedingly high. Transparencies cannot be estimated sharply as regards their degree of development if they have been transferred to porcelain.

Collodion Bottle.—Cross' filtering and pouring bottle is a very convenient contrivance. It has the advantage that it is cheap and very handy, as no collodion but that which passes through the filter comes into use.

Funnels.—There ought to be two funnels, either glass or india-rubber, and of convenient size, one to be used for sensitizing and the other for the alum bath; and in order to avoid confusion, they should be marked, the former *B*, and the latter *A*, and should *only* be employed for the designed purpose.

Thermometer.—Either a so-called bath thermometer, or one mounted on glass, and with divisions in Fahrenheit and Centigrade degrees is necessary.

Heating Contrivances.—For large quantities of work a so-called "Geyser" is recommended. It consists of a cylinder containing a spiral coil and having an opening at the top for connection with the water-pipe, and a valve at the lower end. Underneath is a gas-burner. It heats the water very fast, and by regulating the burner and the valve of the water supply, any degree of heat can be given to the water. Amateurs will not require such an apparatus, as they will not want large quantities of hot water. It will be sufficient to procure a good single or double-wick "Summer Queen" kerosene stove, and a water-kettle of convenient size. It is an absolute necessity to have a contrivance for heating water, for without hot water nothing can be done. The kettle should hold at least half a gallon; of course all depends on the scale of the work to be done.

Large establishments may be fitted out with some developing and washing trays of large dimensions; the former resting on a sort of cradle and being suspended at the center, are movable in the same manner as a see-saw. The water supplies, cold and hot, should be placed over them, and there may be also provided some roses, which are very useful to give a final wash to the plates; or, the roses from the hot water supply are used to clear up darker portions of the picture under development.

Printing Frames.—The same class of printing frames as are generally employed for silver prints may be used. There are, however, others made expressly for this process, and which have no folding back, since there is no necessity to open the frames during the exposures to the light in order to see the progress made. The frames must be kept free from dust, and dry as possible. It is good to cut some pieces of impermeable paper or of rubber cloth, and lay between the tissue-paper and the back plate of the printing frame. These pieces should be a little larger than the carbon tissue. Very handy and convenient are the printing presses invented by Mr. Sarony; they are too well known to require describing here.

Wood Clips.—About two dozen or more are wanted. They are cheap. The most convenient are those that have a hook on the upper end, by which they may be suspended on a rope or wire.

(*To be continued.*)

SUNLIGHT COLOURS.

BY CAPTAIN W. DE W. ABNEY.*

Sunlight is so intimately woven up with our physical enjoyment of life that it is, perhaps, not the most uninteresting subject that can be chosen for what is—perhaps somewhat pedantically—termed a Friday evening "discourse." Now, no discourse ought to be possible without a text on which to hang one's words, and I think I found a suitable one when walking with an artist friend from South Kensington Museum the other day. The sun appeared like a red disc through one of those fogs which the east wind had brought, and I happened to point it out to him. He looked, and said, "Why is it that the sun appears so red?" Being near the railway station, whither he was bound, I had no time to enter into the subject, but said if he would come to the Royal Institution this evening I would endeavour to explain the matter. I am going to redeem that promise, and to devote at all events a portion of the time allotted to me in answering the question why the sun appears red in a fog. I must first of all appeal to what every one who frequents this theatre is so accustomed to, viz., the spectrum; I am going not to put it in the large and splendid stripe of the most gorgeous colours before you with which you are so well acquainted, but my spectrum will take a more modest form of purer colours some twelve inches in length.

I would ask you to notice which colour is most luminous. I think that no one will dispute that in the yellow we have the most intense luminosity, and that it fades gradually in the red on the one side and in the violet on the other. This, then, may be called a qualitative estimate of relative brightnesses; but I wish now to introduce to you what was novel last year, a quantitative method of measuring the brightness of any part.

Before doing this I must show you the diagram of the apparatus which I shall employ in some of my experiments.

R R are rays (fig. 1) coming from the arc light, or, if we were using sunlight, from a heliostat, and a solar image is formed by a lens L_1 on the slit S_1 of the collimator C. The parallel rays produced by the lens L_2 are partially refracted and partially reflected. The former pass through the prisms P_1P_2, and are focussed to form a spectrum by a lens L_3 on D, a movable ground-glass screen. The rays are collected by a lens L_4 tilted at an angle as shown, to form a white image of the near surface of the second prism on F.

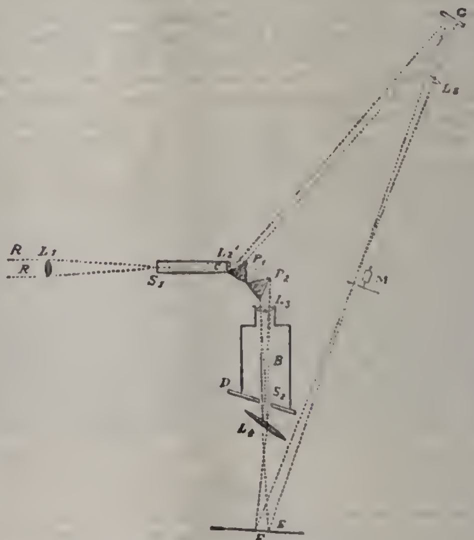

Fig. 1.—Colour Photometer.

Passing a card with a narrow slit S_2 cut in it in front of the spectrum, any colour which I may require can be isolated. The consequence is that, instead of the white patch upon the screen, I have a coloured patch, the colour of which I can alter to any hue lying between the red and the violet. Thus, then, we are able to get a real patch of very appropriately homogeneous light to work with, and it is with these patches of colour that I shall have to deal. Is there any way of measuring the brightness of these patches? was a question asked by General Festing and myself. After trying various plans, we hit upon the method I shall now show you, and if anyone works with it he must become fascinated with it on account of its almost childish simplicity—a simplicity, I may remark, which it took us some months to find out. Placing a rod before the screen, it casts a black shadow surrounded with a coloured background. Now I may cast another shadow from a candle or incandescence lamp, and the two shadows are illuminated, one by the light of the coloured patch, and the other by the light from an incandescence lamp which I am using to-night. [Shown.] Now one stripe is evidently too dark. By an arrangement which I have of altering the resistance interposed between the battery and the lamp, I can diminish or increase the light from the lamp, first making the shadow it illuminates too light and then too dark compared with the other shadow which is illuminated by the coloured light. Evidently there is some position in which the shadows are equally luminous. When that point is reached, I can read off the current which is passing through the lamp, and having previously standardised it for each increment of current, I know what amount of light is given out. This value of the incandescence lamp I can use as an ordinate to a curve, the scale number which marks the position of the colour in the spectrum being the abscissa. This can be done for each part of the spectrum, and so a complete curve can be constructed which we call the illumination curve of the spectrum of the light under consideration.

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* A communication to the Royal Institution of Great Britain.

Now, when we are working in the laboratory with a steady light, we may be at ease with this method; but when we come to working with light such as the sun, in which there may be constant variation owing to passing, and maybe usually imperceptible mist, we are met with a difficulty; and in order to avoid this, General Festing and myself substituted another method, which I will now show you. We made the comparison light part of the light we were measuring. Light which enters the collimating lens partly passes through the prisms, and is partly reflected from the first surface of the prism; that we utilise, thus giving a second shadow. The reflected rays from P_1 fall on G, a silver-on-glass mirror. They are collected by L_5, and form a white image of the prism, also at F. The method we can adopt of altering the intensity of the comparison light is by means of rotating sectors which can be opened or closed at will, and the two shadows thus made equally luminous. [Shown.] But although this is an excellent plan for some purposes, we have found it better to adopt a different method. You will recollect that the brightest part of the spectrum is in the yellow, and that it falls off in brightness on each side, so, instead of opening and closing the sectors, they are set at fixed intervals, and the slit is moved in front of the spectrum, just making the shadow cast by the reflected beam too dark or too light, and oscillating between the two till equality is discovered. The scale number is then noted, and the curve constructed as before. It must be remembered that, on each side of the yellow, equality can be established.

This method of securing a comparison light is very much better for sun work than any other, as any variation in the light whose spectrum is to be measured affects the comparison light in the same degree. Thus, suppose I interpose an artificial cloud before the slit of the spectroscope, having adjusted the two shadows, it will be seen that the passage of steam in front of the slit does not alter the relative intensities; but this result must be received with caution. [The lecturer then proceeded to point out the contrast colours that the shadow of the rod illuminated by white light assumed.]

I must now make a digression. It must not be assumed that every one has the same sense of colour, otherwise there would be no colour-blindness. Part of the researches of General Festing and myself have been on the subject of colour-blindness, and these I must briefly refer to. We test all who come by making them match the luminosity of colours with white light, as I have now shown you; and as a colour-blind person has only two fundamental colour perceptions instead of three, his matching of luminosities is even more accurate than is that made by those whose eyes are normal or nearly normal. It is curious to note how many people are more or less deficient in colour-perception. Some have remarked that it is impossible that they were colour-blind, and would not believe it, and sometimes we have been staggered at first with the remarkable manner in which they recognised colour to which they ultimately proved deficient in perception. For instance, one gentleman when I asked him the name of a red colour patch, said it was sunset colour; he then named green and blue correctly, but when I reverted to the red patch he said green. On testing further he proved totally deficient in the colour-perception of red, and with a brilliant red patch he matched almost a black shadow. The diagram shows you the relative perceptions in the spectrum of this gentleman and myself. There are others who only see three-quarters, others half, and others a quarter the amount of red that we see, whilst some see none. Others see less green, and others less violet; but I have met with no one that can see more than myself or General Festing, whose colour-perceptions are almost identical. Hence we have called our curve of illumination the "normal curve."

We have tested several eminent artists in this manner, and about one half of the number have been proved to see only three-quarters of the amount of red which we see. It might be thought that this would vitiate their powers of matching colour; but it is not so. They paint what they see, and, although they see less red in a subject, they see the same deficiency in their pigments; hence they are correct. If totally deficient, the case of course would be different.

Let us carry our experiments a step further, and see what effect what is known as a turbid medium has upon the illuminating value of different parts of the spectrum. I have here water which has been rendered turbid in a very simple manner. In it has been very cautiously dropped an alcoholic solution of mastic. Now mastic is practically insoluble in water, and directly the alcoholic solution comes in contact with the water, it separates out in very fine particles, which, from their very fineness, remain suspended in the water. I propose now to make an experiment with this turbid water.

I place a glass cell containing water in front of the slit, and on the screen I throw a patch of blue light. I now change it for turbid water in a cell. This thickness much dims the blue; with a still greater thickness the blue has almost gone. If I measure the intensity of the light at each operation, I shall find that it diminishes according to a certain law, which is of the same nature as the law of absorption. For instance, if one inch diminishes the light one-half, the next will diminish it half of that again, the next half of that again, whilst the fourth inch will cause a final diminution of the total light of one-sixteenth. If the first inch allows only one-quarter of the light, the next will only allow one-sixteenth, and the fourth inch will only permit 1/256 part to pass. Let us, however, take a red patch of light and examine it in the same way. We shall find that, when the greater thickness of the turbid medium we used when examining the blue patch of light is placed in front of the slit, much more of this light is allowed to pass than of the blue. If we measure the light we shall find that the same law holds good as before, but that the proportion which passes is invariably greater with the red than the blue. The question then presents itself: Is there any connection between the amounts of the red and the blue which pass? Lord Rayleigh, some years ago, made a theoretical investigation of the subject; but, as far as I am aware, no definite experimental proof of the truth of the theory was made till it was tested last year by General Festing and myself. His law was that for any ray, and through the same thickness, the light transmitted varied inversely as the fourth power of the wave-length. The wave-length 6000 lies in the red, and the wave-length 4000 in the violet. Now 6000 is to 4000 as 3 to 2, and the fourth powers of these wave-lengths are as 81 to 16, or as about 5 to 1. If, then, the four inches of our turbid medium allowed three-quarters of this particular red ray to be transmitted, they would only allow $(\frac{3}{4})^5$, or rather less than one-fourth, of the blue ray to pass. Now this law is not like the law of absorption for ordinary absorbing media—such as coloured glass, for instance—because here we have an increased loss of light running from the red to the blue, and it matters not how the medium is made turbid, whether by varnish, suspended sulphur, or what not. It holds in every case, as long as the particles which make the medium turbid are small enough; and please to recollect that it matters not in the least whether the medium which is rendered turbid is solid, liquid, or air. Sulphur is yellow in mass, and mastic varnish is nearly white, whilst tobacco-smoke when condensed is black, and very minute particles of water are colourless: it matters not what the colour is, the loss of light is *always* the same. The result is simply due to the scattering of light by fine particles, such particles being small in dimensions compared with a wave of light. Now, in this trough is suspended 1/1000 of a cubic inch of mastic varnish, and the water in it measures about 100 cubic inches, or is 100,000 times more in bulk than the varnish. Under a microscope ordinary power it is impossible to distinguish any particles of varnish; it looks like a homogeneous fluid, though we know that mastic will not dissolve in water. Now a wave-length in the red is about 1/40,000 of an inch, and a little calculation will show that these particles are well within the necessary limits. Prof. Tyndall has delighted audiences here with an exposition of the effect of the scattering of light by small particles in the formation of artificial skies, and it would be superfluous for me to enter more into that. Suffice it to say that when particles are small enough to form the artificial blue sky they are fully small enough to obey the above law, and that even larger particles will suffice. We may sum up by saying that very fine particles scatter more blue light than red light, and that consequently more red light than blue light passes through a turbid medium, and that the rays obey the law prescribed by theory. I will exemplify this once more by using the whole spectrum and placing this cell, which contains hyposulphite of soda in solution in water, in front of the slit. By dropping in hydrochloric acid, the sulphur separates out in minute particles; and you will see that, as the particles increase in number, the violet, blue, green, and yellow disappear one by one, and only red is left, and finally the red disappears itself.

(*To be continued.*)

Notes.

A large and representative collection of photographs has been gathered together at the Newcastle Industrial Exhibition, the photographic department being under the direction of the Newcastle and Northern Counties Photographic Association. Among the exhibits we have representatives of the various schools of photography, ranging from the striking and impressive "Dawn and Sunset" of H. P. Robinson (No. 157) to such soft and delightful miniatures of woodland scenery as the English amateur delights to make. The judges' report and particulars of awards will be found in another place; the following having received honours:—*Gold Medals*—J. Lafayette, H. Tolley. *Silver Medals*—H. S. Mendelssohn, Paul Lange (two), H. R. Proctor, F. M. Sutcliffe (two), P. M. Laws, M' Auty, Symonds, West and Son, J. Pike, W. Parry. *Bronze Medals*—J. P. Gibson, J. Pike, A. Diston, J. H. T. Ellerbeck, E. W. Alabone. *Special Mentions*—Werner and Sons, F. M. Sutcliffe, A. Diston, A. Donald.

An action between a society actress and a photographer which has just been tried in the American Law Courts gives one a little insight into those peculiar transactions which result in flooding the shop windows with portraits of Mrs. or Miss So-and-so as—whatever the character may be. Miss Olcott, a society actress, belonging to one of the best families in Brooklyn, had made a hit in Sardou's "Theodora," and B. Falk, a New York photographer, instructed his solicitor to wait upon the lessee of the theatre and get him to persuade Miss Olcott to sit. She consented, and the forenoon of two Sundays was spent in removing various scenery and accessories from the theatre to the studio, the arrangement being that the photographer should have the right to sell the photographs and enjoy the profits, giving Miss Olcott as many copies as she required for her personal use. Notwithstanding, Mr. Falk some time after sent in a demand for 149 dollars for photographs supplied, and as Miss Olcott refused to pay he brought an action to recover. Whatever the agreement may have been, Mr. Falk did not take Miss Olcott's view, and brought two witnesses to prove that she was wrong. Miss Olcott also had two witnesses, and in the end the judge gave it in her favour. Mr. Falk appealed to a higher court, but the judgment was confirmed, and the appellant condemned in costs.

This judgment accords with the common-sense view of the question. Whatever may have been the custom years ago, it is pretty clear that no professional, whether belonging to "society" or not, would now sit for the mere purpose of putting money into the photographer's pocket. No doubt the advertisement is worth something, but gratis copies are the least the sitter expects.

By the way, as the term "solicitor" is likely to be misunderstood, it is as well to say that a "solicitor" in this case has nothing to do with law. The gentleman employed to look out for business, and generally "puff" an establishment, is dignified in America by the name of solicitor. In England he would be called a canvasser. So far as we know, the "solicitor" is not employed by English photographers save in connection with portrait clubs.

The Camera Club of London generally regards any photographer who does not place himself at the disposition of the public for the making of photographs as an amateur; but the rules of the Society of Amateur Photographers of New York are more stringent, and a gentleman engaged in a photographic manufacturing business is only admitted to a sort of half communion (subscribing member). Although in this respect the New York Society is the less liberal of the two, it goes beyond the London affiliated club in another matter, as during the past year the New York Association has opened its doors to women as members. When in London, the lady members of the New York Society will, however, have to be regarded as members of our Camera Club.

Photographic enterprise is occasionally very wonderful. Somebody at Skegness advertises "Photograph of Whale, thirty stamps." This is the unfortunate mammal which ran ashore at this desolate watering-place and got captured in consequence. But who would pay half-a-crown for the photograph of a whale, even though it did pay a visit to Skegness? Skegness, which is one of the most forlorn "pleasure resorts" to be found anywhere, evidently places a high value on the "distinguished stranger." But then it has so few notable visitors.

The American Exhibition at Earl's Court is well worth seeing, and in a fortnight will doubtless be still more worth a visit. As regards Buffalo Bill's picturesque Wild West Show, we may express a hope that the management will not persist in the plan, inaugurated on Wednesday last, of closing this show to the general public in order that a private performance may be given for the amusement of those able to pay a high price. Under these circumstances the irritation of people who have come a distance to see the performance must be intense; and although this sort of sacrificing the public interests before the almighty dollar may be considered the right and proper thing in America, it is altogether out of accord with English notions.

The mania for retouching is bringing its Nemesis. The result of photographing a ladies' school was the following instructions to the retoucher:—No. 1. Pug nose; pull it down. No. 2. Put dimple in her chin. No. 3. She wants a new ear. No. 4. Too much foot; pare it. No. 5. Cross-eyed; change 'em. No. 6. Pug nose; change to *retroussè*. No. 7. Too much mouth. No. 8. Improve bust. No. 9. Wants to be made pretty (doubt if it's possible); extra charge. No. 10. Arch eyebrows, thin the lips, and fatten arms. Each number of course refers to a different sitter, and the instructions are the consequence of a long and anxious conference in every case. The retoucher is now a more important person than the photographer. The latter who fails in pleasing his sitter can no longer rely on the old plea—that the fault was the light. The retoucher is expected to make good all defects.

The sooner the suggestion made by the secretary of the Institute of British Architects, that photographs of finished buildings, both exteriors and interiors, be exhibited at the Academy, is carried out, the better for the feelings of architects. It is very certain, as the *Builder* last week points out, that people falter when they reach the architectural room at the Royal Academy, and turn back. Some, according to our contemporary, laugh scornfully, and exclaim, "Oh! I don't want to go in there." "Architectural drawings!" exclaims another; "oh! let us go out again; I don't care for them." "What on earth is this?" exclaims a lady, with a look of bewilderment, and almost as if the room were not a proper one to come into. Then enter two young "Johnies," in irreproachable costume. "Ah! just the sort o' thing, don't yer know, that you see in an estate agent's window, don't yer know." Photographs would surely not look so "bald" and empty as do the orthodox architectural drawings.

Besides, it might prove the thin edge of the wedge. If photographs of buildings are admissible, why not photographs of trees—in other words, landscapes? The answer would probably be that a building is a work of art, but a tree is not.

The French Crown jewels advertised to be sold by auction this week were photographed some time ago, but either the negatives or the prints were so indifferent that M. Marrett, President of the Jewellery Trade Association, has addressed a request to M. Tiphaigne, *Directeur General de Domaines*, that other photographic reproductions might be made with more care. Instructions to this effect have accordingly been given to the photographer who has already executed a series for the catalogue. Probably the illustrations purporting to be from photographs which appeared last week in *La Nature* were taken from the catalogue negatives. If so, we can quite understand the Association desiring better ones. Those already taken are far too small to give one the least idea of even the shape of many of the jewels. Indeed, after looking at one of these illustrations, the rapture and awe which the Crown jewels seemed to have inspired in the minds of some writers appear positively ridiculous.

The editor's waste paper basket has now, to a great extent, lost its sting to the amateur author; photography having made it so easy to reserve a copy of any manuscript sent. Indeed, the MSS. of a three volume novel can very well be reproduced on half-a-dozen quarter plates, and this without in any way going to the extreme of reduction which was adopted in the case of the French Pigeon Post.

Patent Intelligence.

Applications for Letters Patent.

6613. SAMUEL WHITE ROUCH, 180, Strand, London, W.C., for "An improved detective camera for artists."—5th May, 1887.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

393 of 1883. A. J. BEER.—Photometer.

Specifications Published.

7155. ARTHUR SAMUEL NEWMAN, of 87, Evershot Road, Finsbury Park, in the County of Middlesex, Electrician, for "Improvements in photographic cameras."—Dated 27th May, 1886.

The patentee says:—

One part of my improvements relates to an improved method of fixing the camera front in position, when set up by means of a special arrangement of link motion which forms a swing front without extra apparatus.

For this purpose a lever arm is connected to one side of the tailboard so as to move on a pin joint. The lower end of the lever arm is formed with a quadrant, which can be fixed to the tailboard by a set screw. The upper end of the lever arm is connected to the side of the camera front by a jointed link which holds it in position when set up.

Another part of my improvements relates to the method of clamping the camera back to the sliding board, and in allowing side swing to the back without extra apparatus for the purpose.

According to this part of my improvements the rack and focussing screw are placed in the centre of the sliding board, the axis of the pinion being vertical, and the body is held in position by means of a cam or cams, actuated by a lever or levers let into a recess in the side or sides of the camera back, the cam or cams acting to press a spring or springs down on to the upper side of the metal slide or slides, thus clamping and holding the camera back in position when focussed.

Another part of my improvements consists in constructing the tailboard in a special manner so as to allow the tripod head and focussing screw to be flush, the tripod head being housed within the tailboard.

A PHOTOGRAPHER'S TRIP TO THE SPANISH MAIN.

BY LYONEL CLARK.*

I MUST preface my remarks by mentioning that my trip was not undertaken for photographic purposes, but on business, and therefore these experiences are simply incidental; furthermore, being compelled to start at very short notice, my preparations were very incomplete, and I am sadly afraid that I shall have to tell you to-night rather of what I did not do, than of what I did. I believe the Colonial Secretary is not present to-night; but, for the benefit of those whose geographical knowledge is equally hazy, I will throw on the screen a track chart showing my route. You will see that the outward voyage—a plain line—passes to the southward of the Azores, avoiding the Gulf Stream, and making straight for Barbadoes; then to St. Vincent, Grenada, Trinidad, and along the Venezuela coasts to La Guayra and Porto Cabello; whilst the return voyage—a dotted line—is practically the same (only touching at Carupano) as far as Barbadoes, and then a grand circle track passing to the northward of the Azores to Plymouth and Southampton. We left England on December 15, a bright, frosty day, smooth sea, and slight haze, the whole passenger-list—eighty in all—at dinner, and as merry as the proverbial marriage-bell. The voyage down Channel was fraught with the usual interest—a shiver on deck in the cold east wind to see the last of the Start lights, a momentary excitement as the port light of a sailing vessel looms up through the haze under our starboard bow, and we just shave her stern, near enough, however, to make her skipper hail us to know "What ship is that?" The ship on which fate and the Royal Mail placed me was the *Para*, originally built for the Pacific Steam Navigation Company. As the slide shows you, she is a barque-rigged vessel, with two funnels. Her internal arrangements are of the ancient type—that is, the saloon is longitudinal, and has cabins on each side of it—an ill wind that blows nobody any good, for, for the first few days at least, the groans of the sick are not at all appetising to the robust, nor, I presume, are the rattle of knives and forks and smell of meals what the bilious sufferers find most congenial.

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* A communication to the Camera Club.

Although we started with such fine weather, the night brought a change, and next morning we were rolling and pitching under fore-and-aft canvas. At breakfast—ah, what a falling-off was there!—empty seats, and here and there a few specimens of the male sex dotted about, some of them looking very doubtful whether it were they or the fishes that ought to be feeding. But this was but a commencement, for the wind gradually veered to the North-East, freshening; and three days out we were in as nice a little Atlantic gale as one wishes to see. I got my camera out, and endeavoured to get some views of waves; and rigging up the doctor's surgery as a dark-room, attempted to develop; but, alas! my steward had been greatly interested in my photographic attempts, and had assuaged his curiosity by looking at the plates, at least, so I suppose, for the resulting negatives came out black as Erebus; but one did I manage to save, and that, as you see, gives no idea of the magnitude of these waves. Our vessel was over three hundred feet long, and when the stern was in the trough her figure-head was just surmounting the crest. Large as was our vessel, we were pooped several times, and one sea caught me where I was standing under the lee of the engine hatches, and in trying to escape it, I slipped and fell, and severely tore my shin, so that for the rest of my cruise I was on my back, and photography *non est*. But why weary you with the record of such an ordinary voyage? We were twelve days doing what it took Columbus months to do. Now we are passing the Azores, hidden in the clouds somewhere to the north. Here took place the memorable fight off Flores, where Sir Richard Grenville in the *Revenge* fought eight Spanish armadas for twelve hours, and defied the whole fleet of fifty-one sail lying around her, waiting "like dogs around the dying forest king." Now the weather is getting warmer; the famous sargosso or gulf-weed is seen all around us—a plant always moving, living, breeding, and dying on the ocean swell, never touching bottom; a relic, some say, of a vast former submerged continent—the fabled Atlantis of old. Now shoals of flying fish dart from under our bows, the sea is of a strange blue, different in colour to anything here, and appears absolutely solid, chiselled out of lapis lazuli; gorgeous sunrises and sunsets, new stars away down there in the south, our own familiar constellations skulking low down on the northern horizon, and taking strange shapes.

Christmas-day on board, nearly as miserable as that merry festival generally is on shore; a great time, however, for the parsons, of which we had a cargo on board, who got up choirs and other harmless amusements. Next day—Sunday—parsons still to the fore, working off yesterday's unfinished homilies cold. Now each day gets warmer; and it is a pleasure to sit on the quarter-deck in the warm air, and not have to hang round the funnels for warmth. A rush on deck one morning to see the southern cross—rather a fraud, by the way. Now Aldebaran, at the zenith, tells us we have passed the Tropic of Cancer, and are in latitude 23—in the tropics at last, white waistcoats and muslin dresses, a deluge from a tropical raincloud, a red light on the starboard bow, a white one ahead, and early next morning we are steaming past the low shores of Barbadoes. And as the sun rises, the rattling of the anchor-chain in the hawse-pipes and the boom of the saluting-gun tell us that the first part of our journey is over, and we are in Barbadoes roads, the Clapham Junction of the West Indies; for from here the inter-colonial boats branch off for the northern islands for Demerara or Trinidad and the Spanish Main, whilst the English boat continues her westerly course to Central America. And now all is confusion, heaps of luggage on deck, passengers taking leave of new-found friends on board and being welcomed by their old ones from the shore, boats-loads of niggers laughing, gesticulating; men-o'-war's boats coming off for despatches; officers from the other ships coming to greet comrades and get news from home, agents and harbour master, doctors and quarantine officers—as motley a scene as one could well imagine. Every ones rushes ashore like foals turned out to grass; I, with my lame leg, am denied this pleasure, and remain quietly on board and watch the scene from my deck-chair. Barbadoes from the sea is neither interesting nor picturesque. A low, flat island, somewhat like the Isle of Wight, but cultivated from top to bottom, dotted all over with little white cabins, were it not for the cocoa-nut palms on the beach, and the marvellous emerald green of the waves as they break over yon coral point, it would be difficult to imagine you are abroad.

The capital, Bridgetown, is in noways remarkable either, but the old *carenage* or harbour is quaint. I show you a slide of it, which I took on my return voyage; the crowds of blacks, an exaggerated Christy Minstrel troupe let loose, the puncheons of molasses and rum, bags of sugar, and bunches of bananas are novel, but there is nothing distinctly tropical in it all, and the general feeling is one of disappointment. However, you have little time for criticism, for the intercolonial steamer starts at five, and you have your baggage to tranship and good-byes to say to kind friends bound for other ports, and it is with a feeling of sadness, after all, that you leave the old ship that for the last twelve days you have been longing to get away from. And dinner on our new vessel is rather melancholy, for we are thinking of those we have left on the other boats now steaming out into the purple western mist. When shall we meet them again, and where? But mail-boats are as inexorable as the tide, and our skipper is as callous as the fates, and at the appointed time bang goes the gun, up comes the mud-hook, and away we go over the bar in our turn, with our prow pointing to St. Vincent, and the romantic ones have to content themselves with imagination and cigars, whilst they sit on deck, under the soft rays of the moon glistening on the quiet tropical sea, whilst the practical cajole the purser into giving them better berths. The warning signal-gun brings us on deck early next morning, and we find ourselves lying in a sheltered bay off St. Vincent. And now for the first time we see a real West India island, volcanic evidently, peaks on peaks, that Sisyphus has driven straight from the bowels of the earth; no rounded hummocks, but towering points soaring boldly up to the zenith, and leading the eye up gradually to the grand central cone, and the whole covered with luxuriant vegetation—not a bare rock anywhere, every crag wooded. Round the shore a fringe of golden cocoa-nuts, here the emerald green flash of the sugar-canes, here a row of stately palmistes or cabbage palms; little wooden houses dotted here and there, as the view of the principal street shows; houses, of which the present slide will give you some idea, covered with wooden shingles, and set in a bower of tropical flowers; or else houses like this one, reminding me somehow of Clovelly. Little streams—torrents in the rainy season—cutting through the town on their way to the sea, and fringed with banana and bread fruits, and other strange plants: and the bay itself, with its cliffs jutting out, covered again with vegetation that hides every trace of their geological formation. But time is short, and we are away once more, bound for Grenada, pass the Grenadines, Becquio, Mustique Canonau, Carriacou; three hundred in all, they say, every one a thing of beauty—an emerald floating on the sapphire sea. Whilst we are steaming past this kaleidoscope of beauty, a word about the ship we were on. The R.M.S. *Eden* was built by the Barrow Shipbuilding Company, where I happened to be engaged at the time, so she was an old friend, and a nicer vessel was never turned out from there, and her captain, Kenneth McKenzie, keeps her as smart and taut as a man-of-war, and, to boot, is the nicest fellow living, and so, too, are all his officers, and I never spent a happier time than that week on board the *Eden* with her jovial crew. The table, too, was as good as the ship, and you may go far and fare a good deal worse in many a noted restaurant.

At St. Vincent we shipped a deck-load of niggers, and a motley crowd they made on the forecastle. A paying cargo they are. They load and discharge themselves, and cost nothing to keep; and if they do get a drenching from a tropical shower or a green sea on board, it only washes them, and does no harm. Here, also, I tumbled against a brother-smut, Dr. Boyd, a photographer of no mean merit; and we had a mutual examination of kits, and parted at Grenada the best of friends, and I was right well pleased to shake his hand again as I passed through this lovely island on my return. For Grenada is, indeed, a gem; lovely in shape as it looms up in the distance, it is still lovelier when you approach, and drop anchor off George Town. And now, niggers with boat loads of fruit come off, pulling round yonder point, oranges, green tangerenes as big as melons, mangoes, avocado pears, water-lemons, limes, bananas, and many strange fruits and vegetables that only a botanist can describe.

You tumble into a boat, and four stalwart niggers row you ashore, their eyes and teeth gleaming with merriment; for as the Chinese expression is one of sadness, so is the negro's one of overflowing merriment. Away you go round the point, under the once formidable old castle there, and you shoot into a lagoon so beautiful that you involuntarily murmur, "Paradise!" A crater of a now extinct volcano, filled with the calmest and most liquid water, reflecting the fringe of cocoanuts and palms all round its shores, the mouth guarded by the old castle, a very Cerberus, protecting the village that lies under its flanks—a place that reminds us what one read in one's boyish days of the lonely keys where pirates lurked with their murky craft, and yon boat might well be a pirate schooner, laden with the fat of many a plundered West Indiaman. But alas! for romance; this is the nineteenth century, and she is only a harmless Trinidad trader, and the village, the loyal burg of Georgetown, from whence the best cocoa is exported; and you scramble ashore, and up and down the hilly streets of this quaint town, and climb up to the keep of the grim old castle there, and gaze down on the quiet lagoon and its palm fringe that lies at your feet, and long to stay there dreaming for ever. But time is up, the first gun has fired, and, like the Wandering Jew, you must away again. And again the screw ploughs through the blue waters of the Caribbean Sea, another quiet tranquil night, and before the dawn you are called up by the considerate skipper to see the celebrated Bocas. In the grim, grey twilight the ship seems to be rushing straight on to those cold, grey cliffs ahead, against which the surges lashed by the N.E. trade dash; a quick order to the helmsman, and the very cliffs seem to open, and you enter the narrow Monos Boca—monkey's mouth. Instinctively the classical voyage of Jason recurs to you, and you wonder for an instant whether these rocks will close together and crush you. The next instant you are through, and in the absolutely calm Gulf of Paria, on your left, the lovely blue hills of Trinidad, stretching away for many a mile, till they are lost in the morning mist that shrouds the rising sun; to your right, just catching its rays, the last flanks of the easternmost spurs of the grand Cordilleras of the Spanish Main—ridges coming down without break from the mighty Andes, 800 miles to the west, stretching out their buttresses to greet the rising sun, and as if to warn Phœbus what a task is before him, and give his fiery steeds a gradual lift for their final spring across the snow-clad Andes. On goes the ship, ploughing through the muddy waters of the Orinoco delta, past the Five Islands—five of Nature's gems; and now, down in yonder blue mist, is the town of Port of Spain, a name recalling England's conquest over that country; and our falling anchor churns up clouds of the yellow mud of the Golfo Triste, where Drake had many a tough fight with with the Hidalgos in days of yore. Port of Spain, as you see, is built on a flat promontory, and the ships cannot approach within a mile of the shore, but lie idly floating on the greasy lake. Slowly, but surely, the muddy alluvium of the Orinoco is filling up the whole of the bay, and before long Port of Spain will be an inland town, and the little lighthouse there useless, and its wharves empty and deserted.

What pages one could write about this town, interesting in every respect; its quaint houses, the quays and warehouses, the motley population; coolies from Hindostan and their graceful women; awkward, grinning blacks; slender, half-savage Carribean Indians or Guaranis from the Main, Englishmen, Spaniards, French, and Creoles; tourists and planters, every kind of attire, every kind of language, and over the whole a tropical sun pours its rays of fire, striking you almost a blow when you step into it out from the shade. Black vultures everywhere, on all the houses and all the trees, doing right good scavenger-work. The busy market, and its chattering jabber, where Hindoo and African haggle over their plantains and salt-fish, and the walks all around, whether down the coast, through the cocal, where the cocoa-nuts grow, or up the road, through fields of the wondrously green sugar-canes, where the patient oxen, magnificent creatures, slowly and laboriously drag the load of canes to the crushing mill, or up a mountain pass, the stream babbling alongside the road; under trees covered with creepers here, bamboos, tree ferns there, climbers everywhere—everything new, everything strange. Every tree a home for thousands of parasites—wild vines, cacti, air plants, matapalos, long tresses of green seaweed; every twig a study of tropical life. Some one once wrote a book called "Round my Garden." Fifty men could write fifty encyclopædias about a single tree here. Memories of the beauties of this island flow too fast for words. I remember a trip to the Blue Basin—a rush of bright water across a gloomy dell, crammed with gigantic ferns, huge bananas, and other large-leaved plants, and a glimpse from the hills of the great bay at your feet. Another trip to the Maraccas falls will long be remembered. A drive there, then dismissing the carriage, I and my coolie, who was to carry my camera, climbed up the rough path in the tropical rain, winding round the hills through coffee and cacao plantations till, of a sudden, we saw ahead of us the fall, spurting out from the top of the wooded cliff, a silver comet across the dark blue shade of the gully. A fresh scramble over a swollen stream, and then through a tropical forest, trees shooting up in every direction, lianes and liantasses hanging down everywhere, huge arums, bigger ferns, magnificent orchids, everywhere. Steven's auction-room on a Thursday planted on every square yard of tropical soil; photography almost hopeless, everything so close to you, everything so confused. I tried one beautiful view along the rough path, but fates were adverse; on the return my coolie slipped, away went camera and coolie down the slope, and smash went the plate, the camera was too damaged also to use, and many a pretty bit did I lose that day.

To continue, however, we struggled through the forest, and, all of a sudden, without any warning, we turned the corner, and there was the fall, a sheet of spray, not fifty feet off, but falling vertically over three hundred feet; no lens ever made could take in such a view; your very neck ached trying to look at the summit, and you instinctively shrunk back, fearing the cliff was falling on you. And now the rain came down in earnest; drenched, we sought the shelter of a creole hut and dried our clothes—at least I did, my coolie hadn't any clothes properly, so to speak—and drank delicious coffee grown on the place, and eat strange vegetables, whilst its hospitable owner grinned delight. Here I saw the way they have of extracting the poisonous juices from the cassava. A plaited basket, of a long, serpentine shape, is filled with the pounded pulp; a weight applied to the end of the wicker sieve lengthens the tube, lessening its diameter, and so squeezes all the juice out, which is collected in a pan. The squeezed flour is then roasted over a fire, and made up into cakes, which don't taste unlike grilled sawdust. A sad journey home with a broken camera, past many a forbidden pretty scene, nine rivers to be forded, breast high. There was nothing for it but off with your pants, pick your shirt up in your teeth, and go in for it. To add to my troubles, my coolie gave in, and I had to carry the camera—an 11 by 7 and 4, charged double backs, &c., myself. However, we got back, and though the recollections of my lost negatives haunt me still, yet, with all its faults, I would not have missed the excursion. And for the photographer there are many such trips to be made in this island—the beauties of the Northern Mountains, the strange pitch lake at Labrea, the five islands, the Bocas themselves. Although I passed through these four times, I was never able to get a photograph. It was always too late or too early. My few days in Trinidad soon passed, and once more I was steaming out of the gulf bound for the Spanish Main, La Guayra, and Carácas.

(*To be continued.*)

MANUFACTURER OF LENSES.

The American Lithographer and Printer, in describing a visit to the works of the Gundlach Optical Company of Rochester, New York, says:—

"Mr. H. H. Turner, of the company, told us that the glass comes in plates varying from six to nine inches square, and from three-quarters of an inch to an inch in thickness. We import it directly from Europe, and as none is made in this country there is no duty to pay, but it is costly enough notwithstanding; that piece of greenish tint being worth $10 a pound. It reaches us in the rough state, just as it is left by the glass blowers, with the exception that each plate is polished on the edge at a few points, to let the purchaser look through it and see how clear and free from blemish it is. That plate is used for making the finest small lenses—we make some that are only one-fiftieth of an inch in diameter, and other seven inches across. The process of making a lens consists in cutting a disk of glass out of one of the plates, by pressing the plate against the end of a revolving tube of iron, in a drilling machine, and keeping emery and water supplied to the tube where it rests on the glass. The emery grounds the glass away so quickly that a plate an inch in thickness will be cut through in twenty minutes. The disk or cylinder cut out of the plate is divided into thinner pieces by a toothless circular saw which also eats its way through by the aid of emery. When the original cylinder has been cut into the desired number of plates, each piece is ground convex or concave as may be wanted. The convex ones are brought into shape by a grindstone, while the concave ones are milled out by an iron form and coarse emery. The finishing and final polish are done by the use of fine emery and rouge, which latter is applied to the glass on an accurate shell or lapp covered with wax.

"In the process of grinding and polishing lenses, they are cemented to round sticks prepared for the purpose, and in this way held in the hand, while the lapp or shell upon which they are ground revolves on a finely constructed spindle. The greatest care has to be observed in finishing the lenses and fixing them in their final settings. The value of each glass depends on the skill of the individual optician who makes it, and this applies to even an opera glass.

"There are only seven or eight manufactories of fine lenses in this country, and none west of Rochester. We make fifty or sixty sizes of microscopic lenses and twenty photographic, while the number of telescope lenses is governed by the diameter and focal length desired by the customer. In photographic objectives we have no competitors in the United States. Objectives for the microscope are worth from $5 to $100, and the small ones are the most valuable. Every objective—or, in fact, every lens, of whatever kind—is made after a formula furnished by Mr. Gundlach. This formula prescribes in figures, not only the exact curvature of every surface of an objective—and sometimes as many as twenty-eight surfaces enter into the problem—but also the exact thickness and diameter, as well as the exact distances at which the lenses are to be mounted, as well as the various kinds of glass to be employed in their construction."

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THE FASCINATIONS OF PHOTOGRAPHY.

BY J. LEEK.*

Photography as an intellectual pursuit is so full of pleasurable fascination, that few, if any, who have once commenced its practice, care to relinquish it again. The delicate chemical manipulations and the wonderful effects evolved by their means, hold us enthralled, as it were, from the time of developing our first negative—and how beautiful we thought it!—to the time when we make our own emulsion for the plates, or soar to the higher branches of this beautiful art science. Apart from this, it is a pursuit which can be followed by the tired man of business, or the man of leisure, and even the fairer sex may partake of its pleasures, as the rudiments are soon learnt, and the chemical operations few and easy.

Sets of apparatus can now be bought for fifty shillings, or even less, so that it is within the reach of nearly all. To all, however, who can afford to do so, I would advise the purchase of a really good set, of a size not less than half-plate, and fitted with rectilinear lens and six double dry slides.

Thus equipped, one has only to wait for King Sol, and throwing care to the winds, may sally forth in search of good "shots" or "bits" for his camera. Here we come across an exquisite bit of woodland scenery, such as is seldom seen except in England—it is quite an idyllic fairy glen, at one end of which a cascade of sunlight glinted water is rushing and tumbling down the rocks into the rippling stream below. Everything is opportune for our success in taking a view of this "gem" of nature, and with our extra rapid plates and drop shutter we secure that which would take a painter weeks of application to achieve, and even then it would not be rendered in such truthful detail, as to do so, the beautiful, yet transient, effects of light and shade on the glistening water must be limned instantaneously.

Or, again, it may be that we are one of a merry picnic party, taking place, we will say, in the vicinity of the old moss-covered ruins of some interesting castle. What is more likely to give us more pleasure in years to come than a photograph of the place and people present on the occasion? How many pleasing memories a glimpse of it recalls! These are only a few of the outdoor fascinations of photography, but others meet us at every turn. When after "grinding" hard in the office, factory, or shop, we take our usual annual holiday, what additional zest it adds to it when we are able to bring home with us mementos in the shape of views of the places or things of interest which may be in the neighbourhood in which we are staying. Instead of sitting in our "apartments" smoking or reading, or "doing" the promenade in a listless fashion, we have an incentive to get out in the fresh air in search of pastures new for our camera; and while gaining health and dispelling *ennui* thereby, the higher faculties of our mind are agreeably brought into play in choosing the most artistic point of view, judging the actinic power of the prevailing light, and requisite time of exposure.

To the cyclist photography lends an additional charm, as in his ramblings many and oft will some enchanting picture present itself to his view, which can be readily transferred to his dry plate, and developed at his leisure.

To the manufacturer the camera offers a ready and accurate means of taking photographs of his patterns or wares, while to the naturalist or antiquarian its aid is invaluable. The naturalist is able to secure instantaneous representations of any part of the body while in motion, and the antiquarian to obtain correct pictures of ancient monuments or buildings, which, in the ordinary course of mundane affairs, must either fall a victim to the ravages of time or the spirit of Vandalism.

We will now turn to the fascination offered by what may be termed "home portraiture." Here it is again very great, as nothing is more natural than that we should wish to preserve mementoes of those near and dear to us—"to secure the shadow ere the substance fade," as the poet says. How often do parents wish they had a portrait of the little one who has been taken away from them, or a child yearn for that of a dearly loved parent. The practice of home portraiture need not involve any expensive outlay in the way of studio, &c., unless desired, as by the judicious use of a white screen (a sheet thrown over a clothes horse will answer) and reflectors (such as a swing mirror) excellent portraits may be obtained in an ordinary room. Moreover, home portraiture enables us to gain a better knowledge of the laws of light and shade and the actinic power of the light, by which the relative exposures for the various rapidities of plates may be learned.

To those who can adopt or adapt a studio, a wide field of pleasurable results is open, as by its use character sketches or studies may be arranged and photographed in every conceivable style. We are also better able to regulate the light to our requirements, as it is evident that to obtain a portrait in the Rembrandt style the shadows will have to fall differently than for that of a full face. Again, suppose we are photographing a character group, entitled, we will say, "The Smugglers," the light will have to fall so as to throw long, deep shadows into the impromptu cave we have made from virgin cork, old stones, &c. To any one handy with hammer and saw, a small studio need offer no very great obstacles in the way of its erection, and is a constant source of pleasure when done.

To those who have passed the rudimentary stage of photography, I would advise the study and practice of enlarging, either by day or artificial light, as by this means some of our choice "bits" may be made into beautiful works of art, the argentic bromide paper, if properly developed, giving that dull, matt appearance which is so much admired. After this comes platinotype and carbon printing, and for those engaged in the staple trade of this district, namely, pottery manufactory, I can conceive of nothing more likely to be of advantage and yield good results than the making of photographic enamels.

(*To be continued.*)

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* A Communication to the North Staffordshire Amateur Photographic Association.

Correspondence.

PATENTS AND PATENT SUITS.

SIR,—Considerable publicity was lately given to a suit brought by the Eastman Dry Plate and Film Co. against E. and H. T. Anthony and Co., upon a patent granted to the former for a machine used in making films, and we are charged with "fraud and conspiracy" in having obtained the invention "through a workman named Cossit," whom, it was charged, "we hired away" from the plaintiffs. We deemed it proper to keep silent as to these slanders while the matter was pending, and until a judicial investigation could be had, but now a word to our friends will not be out of place. The Eastman Co.'s motion for an injunction came up for hearing, April 23rd, in the United States Circuit Court, before Judge Shipman, and by him, after full argument on both sides, which was attended by the officers of the Eastman Co., the injunction asked for was denied on the spot, and the provisional injunction, which had been obtained *ex parte*, and without any notice to us, was immediately dissolved. It appeared from our proofs that we had not been guilty of any "fraud" or "conspiracy"; that we had not "hired away" Mr. Cossit; that we had not constructed, or operated, any machine in infringement of the Eastman patent; and that the machine which we had commenced to build we voluntarily stopped upon learning of the Eastman patent, and long before any suit was brought against us. The Eastman party found out that it was easier to make charges of "fraud and conspiracy" than to substantiate them. Mr. B. F. Lee and Mr. George Selden appeared for the Eastman Co., and Mr. Edmund Whetmore and Mr. Wm. A. Jenner represented E. and H. T. Anthony and Co.

The controversy was important, as touching our right to make by machinery "Bromide Paper," for which we hold Letters Patent, dated May 3rd, 1881, and which we are now offering to the trade. Special attention of the public is called to this, and to the suit commenced by us against the Eastman Dry Plate and Film Co. upon this patent. E. & H. T. ANTHONY & Co.

New York, April 27, 1887.

FOCUSSING RATIOS FOR DETECTIVE CAMERAS.

SIR,—The increasing demand for what are termed "detective cameras" has led me to find the simplest formula for ascertaining with any lens the distance after which everything will be in focus, this being the chief point in such apparatus, since the focussing glass is dispensed with. Adopting Dallmeyer's datum, that $\frac{1}{100}$ inch out of focus is not appreciated by the eye when the aperture of the lens does not exceed one inch, then all distance will be in focus with any lens after $8\frac{1}{3} f^2$ R feet, where $f =$ equivalent focus of lens, and $R =$ ratio of intensity. Clearly, only short focus lenses are suitable for the cameras mentioned; otherwise, f^2 becomes very large, and in such lenses the aperture is almost invariably less than one inch; also usually $R = \frac{1}{8}$ to $\frac{1}{10}$. Hence, practically the distance after which all will be in focus is proportional to the square of the equivalent focus (f^2).

I consider that this way of putting the problem is very convenient in practice, and easily converted to other ratios without calculation on paper, for, say, $R = \frac{1}{16}$, then distance becomes $\frac{1}{2} f^2$ feet. These forms are undoubtedly known to lens makers; but photographers in general fancy that the question is a difficult one to solve. Anyone can, with this knowledge, procced to make a detective camera, for, after having decided the distance required, its square root is the focal length of lens in inches required with $\frac{1}{8}$ ratio, and the focussing glass or plate must be set at *exactly* the equivalent focus from the optical centre of the lens. In practice, this is best accomplished by focussing accurately with a magnifier any distant object—say fifty yards off—and what is desired is at once done, for this is the right fixed extension to be given to the camera.—Yours faithfully, DAVID SALOMONS.

Broomhill, Tunbridge Wells, May 7.

A NEW DARK SLIDE.

SIR,—Without wishing to detract from the merit of the new dark slide invented by Mr. Warner, of Holyoke, Mass., and illustrated last week, I would beg to state that I designed one *exactly* similar some five years ago, and have had it, with others alike, in use ever since. The only difference is that I made mine of metal, making it very compact, a $\frac{1}{1}$ plate measuring outside only $9\frac{3}{4}$ by $7\frac{3}{4}$ by $\frac{9}{16}$ in. thick. This I imagine is about the smallest $\frac{1}{1}$ double slide ever built, to be thoroughly trustworthy.

18, *Bernard Street, Southampton.* A. E. BANNISER.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

THE ordinary meeting of this Society was held on Tuesday, the 10th inst., at the Gallery, 5A, Pall Mall East, JAMES GLAISHER, F.R.S., President, in the chair.

Minutes of the previous meeting were read and confirmed, and Chas. W. Hastings was elected a member of the Society.

The CHAIRMAN stated that the paper by Mr. Spurge announced for that occasion was postponed, as it had not arrived in time to be printed and circulated; moreover, Mr. Spurge was not present. At the next ordinary meeting Mr. Crookshanks, of the Royal Microscopical Society, would read a paper on the subject of photo-micrography, and he hoped the members would attend in goodly number, for he was sure that they would be interested in what an authority like Mr. Cruikshanks had to say upon this important subject.

The CHAIRMAN said that as there was no paper for that evening, the committee had suggested for discussion the most practical method of obtaining photographs not less than nine by twelve inches in size.

J. TRAILL TAYLOR thought the simplest way was to take negatives of the size mentioned, and then print on albumenized paper; but, in order to elicit the discussion intended by the question, he would suggest that it be further elucidated by the committee.

T. SEBASTIAN DAVIS said that the question, if not of interest to the general body of members, was one that interested a good many amateurs, especially that section who liked to share in the exhibiting, but hesitated to send in one or two small pictures to stand alone; or if several prints of one size were together they were apt to suffer loss of interest in consequence, however carefully the committee placed them. He did not think that carrying large size apparatus about in search of picturesque subjects was at all tempting, especially if an easy means of enlarging was open to amateurs. If it were possible to utilize the bromide, albumen, or some other process, in such a way that an amateur could enlarge, say, negatives 7 by 5 inches to 12 by 9 inches, it would be a boon. He then dwelt upon the probable blemishes that might be met with in small sizes (quarter-plate, for instance), and that the magnification of pinholes from a 7 by 5 film would be less apparent than with the smaller size.

J. T. TAYLOR thanked Mr. Davis for his explanation, which amounted to "what is the best method of procuring 12 by 10 pictures," and he favoured the enlargement of a small negative; but, seeing that many of the best men in photography produce pictures of a large size by means presumably unknown, it was desirable to have an expression of opinion from them.

W. BEDFORD made no secret about his pictures: they were taken direct in the camera. He had tried very many processes of enlarging, and, in speaking of them, it was necessary to distinguish between those made by means of an enlarged positive of the required dimensions direct from a small negative, and the intermediate negative. If the latter be employed, loss by defects would ensue; but, with skilful treatment, this might be modified. He saw no reason why first-class results should not be obtained by enlarging direct on bromide, albumen, or other papers. He once tried Valentine Blanchard's plan of making a strongly-printed impression upon albumenized paper by contact with an enlarged transparency. The paper negative thus obtained was rendered translucent, and printed from.

V. Blanchard pointed out that by the employment of an enlarged transparency, and from that a paper negative, as was his method, defects were reduced to a minimum. He believed the enlargements of Dixon and Sons were made in this way, except that a carbon negative was substituted for that of albumen paper.

W. E. Debenham remarked that if 7 by 5 negatives were unable to hold their own, enlarging them to 12 by 9 would scarcely be likely to help. It was difficult to see where the improvement would come in.

J. S. Davis referred to the exhibition merely where a 7 by 5 would be lost on account of its size when put on the wall. After careful examination they arrived at the conclusion that the smallest size picture suitable to exhibit was 9 by 12.

T. Samuels said it was satisfactory to know that small pictures had due consideration from the judges. One picture last year was in a particularly obscure position, "Strengthening the Understanding." He introduced this instance to show that the original attracted more attention than the enlargement.

E. Clifton advocated the use of a bromide paper transparency as an easy method of obtaining an enlarged negative. He found no difficulty in shading or dodging parts when so desired.

W. E. Debenham then discoursed upon mercurial intensification with Schlippe's salt. He pointed out the necessity of perfect fixation, and a copious washing at every stage, in order to get certain and good results. The process, he said, was permanent and effective if properly carried out, and he was able to commend it from a long trial in his daily practice.

W. Cobb found a sufficient degree of intensity to result from soaking a film for a few minutes in a plain mercuric chloride solution not stronger than 20 drops of a saturated solution to 10 ounces of water. When dry it would be found to have gained density, and was quite permanent.

Frieze Greene made a proposal that the Society should undertake the instruction of beginners by means of elementary lectures on photographic topics.

It was announced that the last day for receiving pictures for this year's exhibition will be on September 24th. The opening *soirée* will take place on Saturday, October 1st. The next technical meeting is fixed for Tuesday, the 24th inst., and the last ordinary meeting of the session on Tuesday, June 14th.

The President announced that he would contribute £50 towards a fund for a home of their own, or, if nine donors of £100 each were found, he would make his gift up to £100.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 5th, A. L. Henderson in the chair.

W. Bedford, in the absence of J. B. Spurge, gave an outline of some experiments conducted by the latter gentleman to illustrate the effect produced upon a bromide plate by varying one of the constituents of the developer when all other conditions remained constant. In all cases the light used was emitted from Spurge's sensitometer. A short discussion followed.

The Chairman showed Taylor's actinometer, and explained its use. He also brought under notice an old actinometer of his own construction, wherein two circular glass plates, each having a dozen yellow-coloured openings of varying density, formed the screen. By revolving the discs in opposite directions an approximate comparison with a dimly-lighted portion of an object was attainable, and relative exposure could be calculated upon the data obtained.

J. B. B. Wellington exhibited prints to illustrate the orthochromatic effect of a substance as yet unpublished.

H. M. Hastings, who had been continuing his trials with hypochlorite of lime as a fog restrainer in the development of platinotype prints, showed some very extraordinary examples in relation to this subject.

The Chairman said he had restored a badly faded silver print by ridding it of starch or size, steeping it in an acidified aqueous solution of iodine in potassium iodide, washing it thoroughly until the colour was removed, and then re-developing with an acidified mixture of pyro and silver nitrate solutions.

J. B. B. Wellington enquired for an efficient plan of intensifying a collodio-bromide film other than silver, and was informed by the Chairman that mercury, followed by one of the hydrosulphides, would probably answer his purpose. A chat on other methods followed. Some thought cyanide to be the best fixing agent for collodio-bromide films, there being less liability to shadow staining, when intensification was resorted to, than with hypo; others preferred to eliminate the hypo with a solution of common salt.

A. Haddon stated that the yellow stains which sometimes occur upon gelatine negatives which have been intensified with mercury and ammonia may be removed by a prolonged soaking in a dilute solution of hydrogen-chlorine, and the negatives could again be re-intensified safely.

North London Photographic Society.

At the meeting on May 3rd, at Myddelton Hall, Vice-President J. Humphries in the chair, B. B. Fuller, and G. Mengel were elected members.

A. Mackie then delivered a lecture on "The A B C of Photographic Emulsions."

F. W. Cox inquired whether collodion emulsion plates were quick enough for negative work.

The lecturer replied that plates from emulsion made by the method he had demonstrated would make good negatives, but were very slow indeed. A much quicker emulsion might be made with an excess of silver, but then greater care was necessary in the manipulation.

The Chairman inquired how collodion emulsion could be made to give an image of a warm tone.

The lecturer replied that the colour of the image was to a great extent dependent upon the exposure given, a long exposure and restrained developer giving a warm tone.

J. Traill Taylor said that in the early days of gelatine Mr. Burgess made emulsions of great sensitiveness; he did not disclose his process, but his method was probably similar to that of Mr. Bennet. Mr. Kennett also made very sensitive plates, but had extreme difficulty in inducing his patrons, who were accustomed to collodion, to give sufficiently short exposures. Mr. Kennett sold his emulsion in the form of dry pellicle. Mr. Taylor believed that if it could be obtained in this form now it would be of great convenience to photographers in the colonies and elsewhere.

W. M. Ashman thought the meeting would like to hear something about the methods employed in coating gelatine plates.

The lecturer said that his lecture professed to treat of emulsions only, and not of the method of using them. However, it was necessary when plates were to be coated to prepare a level surface, say of glass or slate, upon which to lay the plate until the emulsion set. The emulsion was flowed over the plate in a somewhat similar way to coating plates with collodion.

E. Clifton said, with reference to the keeping qualities of collodion emulsion, he had purchased a bottle of Messrs. Wratten and Wainwright about seven years ago; five years after it was made, he had prepared plates from it which he exposed and developed, producing perfect results. He had still some left, which he shortly intended to test again.

In reply to Mr. Taylor, the lecturer said that he had, in the early days of gelatine emulsion, used camphor to prevent the emulsion from decomposition when it was required to be kept. Thymol, however, was now more frequently used, and acted perfectly efficiently.

Saturday afternoon outing, on May 14, to Hendon. Train, 2·41 from Moorgate Street. Next meeting on Tuesday, May 17. Demonstration by Mr. Walker, of the Eastman Company. Visitors invited.

Camera Club.

On Thursday, April 28th, members and friends gathered to hear Lyonel Clark read an account of his recent trip to the Spanish Main, (see page 297.) J. Traill Taylor occupied the chair.

A most interesting lecture was delivered, and the address was illustrated by lantern slides made from negatives taken by Mr. Clark on the journey.

Previous to the lecture, and in response to the invitation of the Chairman, Mr. Clark showed a new washing and drying rack for negatives, the invention of a Mr. Blackmore, in which the negatives are slipped into grooves and immersed in a pail or pan of water; when sufficiently washed the rack can be hung up and the negatives dried. On removing the plates the rack folds up and can be hung up out of the way. It is especially convenient for travelling.

G. Davison showed an excellent negative on the new Froedman film, taken the previous day at Burnham Beeches. This film is manufactured by the Woodbury Tissue Company. It is treated like an ordinary negative, no stripping or special manipulation being required. The specimen showed was most excellent.

Mr. Ferrero showed some interesting experiments on the rapidity of shutters, made by photographing a white spot on a bicycle wheel revolving at a fixed rate. Furnell's shutter gave, at 0, one-forty-sixth of a second; at shortest possible exposure, one-sixty-ninth; set at one-quarter of a second, it gave one-seventeenth. Lancaster's Instantograph gave one-thirty-fourth of a second. The "Mary Ann" varied from one-tenth to one-twenty-seventh of a second, according to elastics used. Drop shutter gave one-twelfth of a second without elastic band, and one-twenty-seventh with. Prints were handed round.

Mr. Clark showed some travelling bottles manufactured by Messrs. Hinton and Co. The glass bottle is protected by a metal case opening with a bayonet joint: a spring in the top keeps the bottle in place.

Some slides of the group taken at the recent excursion to Hayes by Messrs Dresser and Barclay were shown, and also a very interesting slide of a negative taken by Lyonel Clark and W. H. Hyslop at the St. James's Theatre. The negative was on a plate isochromatised by Mr. Hyslop. The exposure was ten seconds, with the ordinary gaslight of the theatre, no limelight even being used, and the details were well shown on the slide.

The Secretary drew attention to the Club excursion to Gomshall, arranged for Saturday, May 14.

At the meeting held on May 5 the first set of lantern slides sent by the American societies in exchange with the Camera Club was again exhibited previous to distribution. A good company assembled, and the exhibition gave very great pleasure. W. A. Greene occupied the chair, and, at his invitation, the Hon. Secretary drew the attention of those present to some very fine photographs of theatrical scenes at the Criterion, taken by J. F. Roberts. These photographs were taken by the ordinary light of the theatre in April last, and show some of the best and most finished work of the kind ever done.

Some slides made by Mr. Roberts from his negatives, and also others showing groups by Mr. Barclay, taken at the Burnham Beeches Club excursion, were put through the lantern. The American slides were then shown. The collection includes a very great variety of interesting subjects, amongst the best of which were tow boats on the Ohio and other river scenes. Some very picturesque bits by Mr. Slettinius attracted much attention, as did also several humorous subjects with children and pictures of winter scenes and yachts racing.

The 1887 International Exchange is in course of arrangement, and it is hoped that equal success will attend it.

Dundee and East of Scotland Photographic Association.

The annual meeting for election of office-bearers for the next session was held in Lamb's Hotel last Thursday, when the following were unanimously elected:—

Hon. President—Dr. Carnelley.
President—G. D. Macdougald, F.I.C.
Council—Messrs. Geddes, Fraser, Kerr, Mathewson, J. R. Wilson, Maclaren, G. A. Martin, Hill, and Ower.
Treasurer—V. C. Baird. *Secretary*—James Rattray.
Vice-Presidents—Dr. Tulloch and John Robertson.

James C. Cox was chosen as the delegate of the Society to the Photographic Convention to be held in Glasgow in July.

North Staffordshire Amateur Photographic Association.

The ordinary monthly meeting was held at the Mechanics' Institute, Hanley, on May 4, under the presidency of C. Alfieri.

A list of eight excursions for the season 1887 was drawn up, and their approximate dates arranged, the places selected being Buxton and Miller's Dale for May. Afterwards Dovedale, Haddon and Asford, Trentham, Keele, Moreton, Tutbury, and Lichfield, due notice of which will be given to members by the Hon. Secretary.

Messrs. Drummond and G. Wright were elected members of the Association.

The opinion of the members having previously been obtained by circular, it was decided that the annual subscription be in future reduced to 5s.

The President exhibited a beautiful 12 by 10 silver print of a ruined abbey in Denbighshire, the negative of which he had himself seen Mr. Francis Bedford take thirty years ago. The print was one of the first taken from the negative, and was almost as good as when first produced.

Mr. Leck was then called upon by the President to read his paper upon the "Fascinations of Photography" (see page 299).

This was listened to with great attention, and a vote of thanks passed to Mr. Leck for his interesting and instructive lecture.

Liverpool Amateur Photographic Association.

The monthly meeting was held on the 28th ultimo, at the Royal Institution, President George H. Rutter in the chair.

Richard P. Preston, Thomas Comber, J.P., William A. Caldwell, and Edward Swinden, were elected members.

The Secretary called attention to the presentation prints for last year, and announced that they would be distributed to all members applying for them who have duly paid their last year's subscription.

J. A. Forrest called attention to the serious alteration in colour of the great public buildings in our large manufacturing towns, and the increasing difficulty of photographing them, giving instances of public buildings which are now impossible to photograph. He exhibited some paper negatives reproduced from old prints in his possession, from which negatives he could readily multiply prints; also some beautiful prints of the Manchester Town Hall, both interior and exterior, by Mr. Pollitt, of the Manchester Photographic Society, and advised amateur photographers to secure photographs of all such buildings whilst it was still possible.

John Hargreaves, F.R.H.S., gave a very interesting description of the objects of antiquarian and photographic interest in the Hundred of Wirral—the peninsula between the Mersey and the Dee—instancing Birkenhead, Bidston, New Brighton, Wallasea; Leasowe Castle, containing an old mantelpiece which was originally in the Star Chamber; Irly Old Hall, a black and white building, which he pronounced to be the most picturesque building in the Hundred; Thurstaston; Bebington, with its church, one of the most interesting ecclesiastical buildings in the district; Hooton and Poole Halls; Stanton Abbey, of which there are a few remains, but which the monks left and migrated to Whalley Abbey; and many other places of historic and artistic interest.

J. E. Thornton exhibited his shutter, which is similar to the well-known "Kershaw," but has an attachment by which it opens upon pressure of the pneumatic ball, and remains open as long as the pressure continues, thus providing for "time" as well as "instantaneous" exposures.

B. J. Sayce exhibited specimens of fine dry-plate processes from 1861 to 1865—viz. (1) bromo-iodized collodion with gelatine preservative; (2) the Fothergill process with albumen preservative; (3) the tannin and honey process; (4) bromized collodion, sensitized in a sixty-grain nitrate bath, and coated with a solution of tannin, gallic acid, and grape sugar (by this the sensitiveness of wet collodion was obtainable in 1863 on dry plates); (5) examples of negatives and their prints by the collodio-bromide or first practical emulsion process for negatives, introduced in September, 1864. Mr. Sayce also called attention to the comparative indestructibility of negatives by the old favourite process—the collodio-albumen—and showed a print recently made from an unvarnished negative twenty-six years old which had been stored for fifteen years in a damp outhouse, quite unprotected from the moist exhalations of its surroundings.

J. H. Day, the leader of the first excursion of the Association this year (on Easter Monday) to Gawsworth and Marton, read a full report of the trip, showing that the day had been a very successful one, no fewer than sixty-four plates or films having been exposed.

Paul Lange read a brief report of the second excursion to Hooton and Toole Walls, from an analysis of which it appeared that nine members took part, that the lenses employed were two by Ross, three by Wray, one each by Swift, Newton, and Steinheil, and that forty-seven exposures were made, of which thirty-nine were on glass, and eight on Eastman paper, thirty-one of the glass plates used being Ilford, and eight Derwent.

Talk in the Studio.

Comparative Actions of Heat and Solar Radiation—By E. Duclaux.—A large number of organic compounds containing carbon, hydrogen, and oxygen were subjected to the action of heat or solar radiation in presence of air, silver nitrate, potassium permanganate, platinic chloride, auric chloride, and other oxidising agents. The results show that all reactions of the nature of combustion which can be produced by the action of heat can also be produced by solar radiation; but several decompositions which are effected by sunlight cannot be brought about by the influence of heat alone. All the decompositions consist in the splitting up of the original molecule into simpler molecules, amongst which may be mentioned formic, acetic, and butyric acids, methyl and ethyl alcohols, and ether—compounds which are relatively stable in the conditions under which they are formed. As a rule, the same substance yields the same products, whatever the nature of the oxidising agent with which it is in contact; but to this law there are a few exceptions. Lactic acid, for example, yields acetic acid when oxidized by the action of air, but butyric acid when oxidised by mercury salts. The stable products of combustion do not exist ready formed in the original molecules, but are a result of a re-arrangement of the atoms. This is shown by the fact that the same products are obtained from different substances, and also by the fact that one and the same substance may yield different products under different conditions. As a rule, the products contain a smaller number of hydrogen and carbon-atoms than the original substances, the exceptions being formic acid, which is obtained from oxalic acid, and butyric acid, which is obtained from lactic acid. Potassium permanganate, which in many cases will act in the dark, yields the same products as the action of sunlight, and the compounds which it attacks most readily are those which are also least stable in contact with other oxidising agents. It constitutes the most convenient reagent for determining the influence of alkalinity, acidity, &c., on the rate and limit of the oxidizing action.—*Journal of the Chemical Society.*

Occurrence of Silver in Volcanic Ash from the Eruption of Cotopaxi, July 22nd—23rd, 1885. By J. W. Mallet.—The sample was collected at Bahia de Caraguez, where ash had fallen to the depth of several inches, although the place is 120 miles to the westward of Cotopaxi. The specimen consisted of a very fine mobile powder soft to the touch and of a light brownish-grey colour. Under the microscope it appeared to consist of minute, more or less sharp or splintery-edged granules and spicules; quartz, a white and pink or reddish felspar, augite, magnetite (strongly magnetic), and thin scales of deep red specular iron oxide were easily distinguished. When strongly heated, the ash turned dark red-brown, and fused to a nearly black slag. Its sp. gr. = 2·624 at 18°; 0·21 per cent. of the ash was soluble in boiling water, and 6·94 per cent. was dissolved by hydrochloric acid from the portion insoluble in water. The ash dried at 100° contained per cent.—

SiO_2.	Al_2O_3.	Fe_2O_3	FeO.	MgO.	CaO.	Na_2O.	K_2O.	H_2O.
56·89	19·72	4·06	3·65	1·91	5·87	5·14	1·96	0·62

with traces of TiO_2 MnO, Li_2O, Ag, Cl, SO_3, P_2O_5. The silver present amounted to about 1 part in 83,600 of ash, but although the proportion is so small the total amount ejected during the eruption would be considerable when the vastness of the mass of volcanic ash is taken into consideration. The silver was probably present as chloride. This is the first time silver has been found in volcanic ash.—*Journal of the Chemical Society.*

Photographic Club.—The subject for discussion on May 18th will be "The Production of Lantern Slides from Large Negatives." Saturday afternoon outing at Highgate, meet at "Archway Tavern," near 2 o'clock

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Rees Jones.—1. The best lens is one of the rectilinear or symmetrical type. 2. Make it direct in the camera; but it will probably necessitate the construction of a temporary lengthening piece.

G. Carter.—1. Generally speaking, by making a thin negative, painting in a moon, and also some high lights corresponding roughly to the position of the moon: then printing on greenish paper. A really skilful person can obtain fair results by working on these lines. 2. We are not sure that we really understand your question. Why not write in pencil on the back?

B. C. A.—Obtain through the Post Office a set of stamped forms for application for patent, the cost being 20s. Fill them up, and post to the Patent Office, Southampton Buildings, Chancery Lane. Within nine months you must enter a complete specification, and pay an additional fee of £3; but, if you prefer to do so, you can enter the complete specification at once, and in this case the forms for complete specification—bearing a £4 stamp—should be ordered through the Post Office.

G. E. T.—1. A hollow background graduated in tint. 2. Something of the same kind, but shaded to suit the requirements of the case.

Photo-Gravure.—The details have not yet been arranged, but as soon as particulars come to hand we shall publish them.

A Puzzled Amateur.—The last lens on your list is by far the most suitable.

Thomas Ayers.—If you can really make the nature of light manifest to the world, your name will become famous. Like Chapman Jones, we must confess our ignorance.

F. W. Cox.—Even had you sent the permit for our inspection, it would be difficult to form an opinion in the absence of further information; but probably the particulars can be obtained at the office whence the document was issued.

Charles B.—1. We are unable to tell you whether the person to whom you refer has ever exhibited a painting at the Royal Academy; but it is said that he has many times been an exhibitor. If you think the matter of any importance, make enquiries of the secretary. 2. A nomination and the consequent investigation took place; but, as nothing more was done, the natural conclusion is that, upon enquiry, his claims were held to be inadequate.

J. G. Bryan.—French chalk will answer. It should be dusted on, allowed to remain for some half-hour or so, and then be dusted off.

Omega.—In the first series our choice would fall on B or D (the latter if you are likely to occasionally photograph small children), and in the second series we recommend E.

H. C. Braun.—It is rather stupid of your newsagent to make such a blunder; they have been posted to you.

Photographs Registered.

J. C. Catford (Ilfracombe)—6 Photos. of Rev. J. M. Chanter; 1 Photo. of Church Street, Ilfracombe.

Latham & Bott (Longton)—Photo., Cutting the first sod of "Queen's Jubilee Park," Longton.

A. W. Howard (Luton)—Photo. of Snow Scene, Park Road, Luton.

Joseph Bridge (Shrewsbury)—Photo. of T. Groves, Esq., J.P.

A. H. Sharman (Sheffield)—Photo. of the "Sphinx."

W. V. Amey (Landport)—2 Photos. of Dr. Seely.

R. K. R. Flamank (Aston Manor)—Photo. of A. J. Rodway, Esq.

H. Baker (New Street, Birmingham)—Photo. of Her Majesty's Retiring Room, Birmingham.

H. R. Sherborn (Newmarket)—3 Photos. of Marquis of Carmarthen.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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COLOURED PHOTOGRAPHS, AND HINTS ON MAKING THEM.

From J. E. Mayall, of New Bond Street, we received an invitation to view some coloured photographs by "*My new process for producing highly finished coloured photographs without the aid of an artist.*"

Some small portraits were shown to us which were framed and glazed, and in appearance they resembled the kind of result which can be obtained by colouring a carbon print at the back—that is to say, while on the glass or other temporary support, and then stripping on the paper support; a few of the prominent touches being now put upon the front of the picture.

In the case of the specimens shown to us at Mr. Mayall's studio we certainly thought that we detected evidence of the existence of artistic skill on the part of the colourist, although some of the work certainly must have been done by a colourist who could hardly claim to be considered an artist. In short, we could not help thinking that with the coloured photographs shown to us at Mayall's studio, as in the case of all others we have seen, the success of the colouring is in direct proportion to the skill of the colourist. If, however, it can be shown that coloured results equal to the best of those shown can be produced by a person unskilled in the use of colours, we shall have to recognise a distinct step in advance.

In reply to our request for some particulars as to the new process, the person in charge gave us a printed slip—one of a heap lying ready to hand on the desk, and told us that no further details were available as to the process (see patent list, page 315). We reproduce this slip as received from the studio, it being distinctly understood that the statements are not our own.

A New Departure in Coloured Photography.—The progress which has of late years been made in the methods of photography, and in the excellence of the work turned out, has undoubtedly been very great, and the photographer's calling has been transformed into a veritable fine art. Yet there is one thing missing to make the photograph really life-like and perfect, namely, a successful and thoroughly artistic process of colouring the same. The systems at present adopted are all purely mechanical and unscientific, and although many ingenious minds have of late devoted a great deal of study and time to the discovery of some improved process, these endeavours have until recently proved unsuccessful, and the defective method of mechanical colouring by means of the brush is still generally practised. It was reserved to a past master in the art of photography, who at the same time is an adept in chemistry, to solve the problem. Organic chemistry in its newest form is so little understood that it required a competent analyst, well up in the new methods of application both by the microscope and spectroscope, like Mr. J. E. Mayall, the eminent and world-renowned photographer of 164, New Bond Street, to achieve success where so many had failed. Mr. Mayall, in fact, treated the matter on an entirely new basis.

Starting with definite and well-matured scientific principles, Mr. Mayall has been able to lay a foundation of pure chemistry in every portion of the process, building up a complete process by the laws of affinity that renders the subsequent production permanent and indestructible. The new method of producing coloured photographs invented by Mr. Mayall is, as will be seen from the various specimens submitted by him (amongst which are large sized photographs of H.R.H. the Princess Christian, Lady Elliott, and other ladies in court costume, as well as a number of juvenile portraits) perfect and brilliant in every particular. The coloured photographs thus produced, in fact, resemble high works of art, surpassing them even in the higher quality of vitality, each work representing a living presence of the original. To these excellent features must be added the great advantage that climatic influences have no effect upon the work. The importance of Mr. Mayall's discovery can hardly be exaggerated. When once the splendid results of the new process will have become known, there will, no doubt, be a general demand for coloured photographs on Mayall's system. It is therefore no exaggeration to say that the invention will cause a veritable revolution in photography.

Mr. Mayall's premises and studio at New Bond Street are amongst the best fitted in this country. He was one of the first to use the electric light, and has been most successful in its utilization for the purposes of photography. In each of the two studios a powerful electric arc light is fixed underneath an umbrella-shaped reflector, which can be placed in any position by means of an ingenious contrivance. The current is supplied from a gramme dynamo which is driven by an 8 horse-power "Otto" gas engine, both fixed in the basement. Dressing rooms and work rooms are provided, and a sumptuously fitted reception room is replete with the choicest examples of photographic art.

Mr. Mayall's skill in his calling has brought him numerous patrons amongst the upper ten thousand. The army, the clergy, and the votaries of science are patronizing him largely, and it may here be remarked that the public demand for photographs of distinguished clergmen is much greater than that for any other class of photographs, those of actors and actresses not excepted. Excellent specimens of photographs in all sizes up to the very largest, platinotypes, carbon enlargements from cabinet photos, are to be found on the tables and round the walls of the reception room, testifying to the artist's skill in all the branches of his art. In fact, it would be difficult to find in any photographic studio in this country so many excellent photographs of distinguished gentlemen and ladies in the various walks of life, Royalty included.

As the above reprint article does not afford much real information, it may be useful to our readers if we here give brief directions for making coloured photographs on cards, prints coloured at the back in the style which has been made the subject of many patents, and numerous surprising announcements as to what can be done by a person possessing no artistic skill; but, before doing so, we may say that artistic skill *is* required to produce a result worth looking at.

A sheet of glass is carefully cleansed with ammonia and tripoli, after which it is warmed to something over the melting point of wax, and rubbed over with a lump of genuine wax. After this the glass is to be re-warmed, and the wax well rubbed on the surface with a tuft of flannel, the excess of wax being wiped off with another piece of flannel. When quite cold, the glass is to be coated with a tough collodion, and, as soon as the film has set, the plate must be soaked in water until the water flows evenly over the film. A piece of carbon tissue—a brownish tint, such as autotype brown, is to be preferred—which has been exposed under a thinnish negative, is squeezeed down on the soft collodion surface, and the print is developed in the usual way. Regarding the manipulations specially incident to carbon printing, we need not say anything in this place, as the reader who is inexperienced in this branch of work will naturally refer to some book or article on the subject, as, for example, the Autotype Manual, published at 74, New Oxford Street. When the print which has been developed on the collodion surface is dry, all is ready for the colouring; and this colouring may be effected either with ordinary oil colours, or with water colours prepared with albumen. These are sold by Reygondaud of Paris, and also, we believe, by some houses in London. An extemporised substitute for the albumen colour can be made by rubbing up moist water-colours with white of egg, and allowing a little time for the mixed colour to partially dry or thicken on the palette.

In colouring it must be remembered that the tints are lowered by the brown image of the photograph, and, in order to get some sort of coloured effect through the deep shades of a red dress, it is necessary that the image should be thin, or that those portions corresponding to more especially non-actinic tints—as red or yellow—should have been shaded in making the original print. A good way of shading is to stretch a piece of thin tissue paper, such as is sold at the artists' material shops as papier vegétal, at the back of the negative, and to shade on this with powdered black lead and a stump. If oil paints are used, all that is required before the next operation is for the colours to be quite dry; but if albumen colours have been used, the colour must not only be dry, but the colour surface must have been flooded with alcohol or a strong solution of alum to coagulate the albumen.

Now take some autotype double transfer paper, and soak it in warm water until the coating is soft; but care must be taken not to dissolve the coating off. Next lay the plate bearing the coloured image in a dish of cold water, and place the softened surface of the transfer against it; lift both out of the dish together, and force out all excess of water from between them by stroking with the rubber edge of a squeezee—that is to say, a strip of softish rubber set in a handle. Adhesion being established, allow the whole to dry, when the paper can be removed, bringing with it the coloured image.

The disadvantage of using oil-colour is not only the long time required for thorough drying—even if such bad driers as Vandyke brown are avoided—but an occasional want of sufficient adhesion between the oil surface and the transfer paper.

The albumen colours are much to be preferred, but it is well not to depend too much on the insolubility conferred by treatment with either alcohol or alum solution, as occasionally the pigments and other materials work in a contrary direction; in other words, the painted image should be left in the water for as short a time as possible, and great care should be taken not to "drag" the transfer paper on the painted surface.

Minute touches, such as the colouring of the eye, may be applied to the surface of the picture after stripping.

The collodionised surface as stripped from the glass has a smooth highly-glazed appearance which is dulled by the moisture of any aqueous mountant; so the coloured pictures referred to are most advantageously set under a cut-out mount. If it is desired to stiffen the basis into a kind of card, several thicknesses of pasted paper should be squeezeed down over the transfer paper, and this before the picture is stripped from the glass support; a printed sheet, if required, forming the last layer. It is rather difficult to satisfactorily stick an ordinary card on the back of the transfer paper; but if this is attempted the card should be moistened and kept in position by pressure.

THE GROSVENOR GALLERY.

BY WIDE ANGLE.

It is the advantage of a small gallery that, when it contains bad pictures, they at once become prominent. Hence, works which might be hung on the walls of the Academy and be passed unnoticed, are impossible at the Grosvenor. This makes the latter a so much pleasanter place to visit. You are sure that absolutely bad pictures will be absent.

In the West Gallery the pictures of Burne Jones naturally fix the attention. His most remarkable contribution is "The Baleful Head" (No 75), illustrating the desire of Andromeda, after her deliverance from the dragon by Perseus, to look upon the head of Medusa, which, as all students of Lempriere know, had the power of turning into stone those who looked upon it. Whether Mr. Burne Jones has any authority for the curiosity of Andromeda, as some have doubted, does not matter very much. It is sufficient that he has devised a most original picture, and one that will live in the memory. Perseus, arrayed in a wonderfully painted suit of chain armour, holds the hand of Andromeda, who is gazing into what may be supposed to be an ornamental well of clear water. Here she sees mirrored the baleful head held up by Perseus. The idea is suggested, no doubt, by the plan resorted to by Perseus, in his conflict with the Gorgons, of reflecting their faces in his shield. Of course he could have adopted this method to gratify the curiosity of Andromeda, but the idea would not have been so poetical, nor have afforded such scope for romantic treatment. The painter has given the reflection not only of the baleful head, but also the reflections of the faces of the gazers, and the enormous difficulties of the composition have certainly been overcome in a very wonderful way. Few painters could have grappled with such a subject so successfully. "The Garden of Pan" (No 66) is not nearly so striking a work, though the flesh painting is a triumph of technical knowledge. Highly poetic is his picture entitled the "Shadow of the Saint" (No. 39), representing two girls shrinking back terror-stricken at the sight of the shadow of the self-martyred St. Simeon Stylites on a moonlit wall. The power and originality of Mr. Burne Jones shows with great freshness and force in these days of conventionality.

From Mr. Holman Hunt one had a right to expect something better than his "Amarillis" (No. 119) and "Master Hilary—the Tracer" (No. 208). Truth to tell, it is hard to criticise these singular productions. You can only wonder at the outcome of so much conscientious study, and pass on. A meritorious picture by Arthur Hacker (No. 9), illustrating an incident in Kingsley's "Hypatia," occupies much space in the West Gallery. It shows a woman, nude, lying on a sandy plain, and a man leaning over her. Whether the woman is dead or sleeping it is difficult to say. The drawing is admirable, and the pose of the recumbent figure harmonious. Considering, however, that the scene is laid in the broad blaze of day, the flesh is too pale and dull. The brilliancy of flesh tints in the open air is something phenomenal, as anyone can see on any summer's evening by taking a steamboat trip up the Thames and watching the urchins who, unable to resist the attractions of the water, have stripped, and are paddling about. Mr. Sutcliffe's photograph of the "Bathers," in which the flesh is represented as sparkling with light, and yet without any chalkiness, is a good example of this. Another study from the nude, also of considerable merit, is the "Lilith" (No. 24) of the Hon. John Collier. The second wife of Adam, as Mr. Collier has represented her, is, however, decidedly lanky in the legs, and must have been of Herculean strength to have been able to support the weight of so enormous a snake as is wound round her body. Mr. C. E. Halle has, one cannot help thinking, wasted his strength on a subject taken from Machiavelli's "History of Florence." The picture has so little interest that it scarcely justifies wading through a page and a half of the catalogue in order to find its meaning. His "Carnival Souvenir" (No. 46), a study of a fair Venetian, who has removed her mask for a moment, is pleasanter, if less ambitious.

One of the finest landscapes exhibited for some time is Alfred Parsons' "Going Westward" (No. 48). The courage with which Mr. Parsons has attempted to transfer on to canvas the glowing colours of a fiery sunset is worthy of all praise. It is really a faithful rendering, though it may strike the eye at first sight as somewhat glaring. It is one of those pictures which makes the landscape photographer despair, because he knows very well that did he attempt to photograph such a sunset it would result in a "moonlight effect." Mr. G. F. Watts has given us rather a notable picture in "The Judgment of Paris." It is painted with all the force and tenderness with which Mr. Watts embues all his work, and will doubtless be photographed, as was his "Hope" of last year. The colours of the picture are less of an ordeal for photography than were those of the earlier work. E. J. Poynter's "A Corner of the Market Place" (No. 62) is a charming work, full of colour and brightness, and, it is needless to say, correct drawing. J. M. Strudwick is content to follow in the footsteps of Burne Jones; and clever as the painting of the drapery and accessories in "A Love Story" (No. 67) is, it would be desirable to see Mr. Strudwick aiming at something less directly imitative.

Herbert Macullum, like Mr. Napier Hemy, delights in intensely green seas. Mr. Hemy's, however, are the greener of the two. Both artists are well represented by pictures which are neither better nor worse than their very excellent average. P. H. Calderon is another artist who is content to wander in the groove to which long practice has accustomed him. His roseate and emerald tints are pretty well exemplified in his "In Forest Deeps Unseen," a somewhat long-limbed maiden about to take a bath in a forest pool. Mr. Calderon's work belongs essentially to the "pretty" school. G. D. Leslie's "The Boat-House" shows a charmingly reposeful picture of a couple of pretty damsels of the well-known Leslie type, a well-appointed boat and surroundings personifying luxury. W. H. Bartlett's "Off to the Fair, Connemara," may be a truthful rendering of the Irish peasantry; if so, they are of a totally different type from the prosaic, almost ugly men, women, and children revealed by the photographs of the evicted tenants of Glenbeigh. Mr. Bartlett's picture is, I am afraid, idyllic, not naturalistic.

Herbert Schmaltz is represented, with other works, by the picture of a young lady whom he terms "Blondine" (No. 118); the pose is rather strained. A. Stuart Wortley has given in his painting, "The Big Pack," a text for the Society for the Prevention of Cruelty to Animals to preach about. It represents the glories of a *battue.* Guns are blazing away in all directions, the game is dotted all over the picture, and cartridges, spent and unspent, bestrew the ground. Mr. Wortley's game, by the way, is of a prodigious size. There is one feathered specimen, presumably a grouse, which can't weigh less than a dozen pounds. What a feast for an epicure! The heather is capitally painted. C. W. Mitchell's "Through Death unto Life" does not reach the sublimity which the artist has strived to attain. All ghostly representations on canvas somehow fail, and Mr. Mitchell, in trying to show the naturalized body of a saint appearing to a family in the unsuspecting quietude of their home, has not been more successful than a score of other artists who have tried the same thing. Harry Moore's sea piece, "Goree Bay" (No. 180), is a vigorous and truthful rendering of the early morning light on the sea. It is evident the artist has used his eyes. R. Barrett Browning's contribution of a tall girl not much less than eight feet high, and with a foot of proportionate size, "Waiting for the Gondola" (No. 186), is not the best thing he has done; nor can much be said for Keeley Halswell's "The Pass of Brandon, Loch Awe." Lock Awe has been somewhat overdone, and Mr. Keeley Halswell's version of the "Pass," wherein he has torn nature to rags and tatters, and thrown in a rainbow to boot, does not revive one's interest in this hackneyed subject. A capital little picture, which, from its small size and position, might pass unnoticed, is Julius M. Price's "Qu'est-ce qu'il-y-a" (No. 199); the quiet tone is very delightful. H. H. Lathangue's picture of a young woman in a pink cotton dress, lying down in a hay-field, where she is discovered by some hay-makers, is somewhat unintelligible. Mr. Lathangue calls it "The Runaway"; but this does not make one any wiser.

The portraits are very numerous, and many are good. One of the best is H. Herkomer's portrait of Canon Wilberforce (No. 13). Mr. Herkomer is one of the few portrait painters who give a thoroughly satisfactory rendering of the flesh tints of the face. He does not, as Sir John E. Millais often does, see all red and white. Sir John's portrait of Mrs. Charles Stuart Wortley seems to have been very rapidly painted, and something in the way of colour has been left out of the face. It seems all chalk and carmine. Mr. Herkomer's portrait of the late Henry Fawcett is quite equal to his Canon Wilberforce. A pretty group is the Hon. John Collier's Mrs. Bowlby and children, and the same painter has given us a magnificent portrait of J. L. Toole. Had Mr. Toole been a Justice of the Peace he could not have been more glorified nor have worn a better coat. Clever as the work is, it gives one the inference that the popular comedian has got himself up in his very best suit, and brushed and oiled his hair on purpose to sit for his picture. This studious preparation, as any portrait photographer will say, is one of the things best left alone. W. B. Richmond's work is always excellent. His portrait of Mrs. David Little (No. 80) is notable for its harmonious effect. Sir John Millais's portrait of Lord Esher, Master of the Rolls, shows all the artist's wonderful dexterity in representing the intricacies of costume. The gold embroidery on the robe is simply a triumph of deftness. Mr. Frank Holl contributes some solid work in the way of portraiture, and W. Carter's portrait of Sir Richard Brooke (No. 72) is also to be commended. Frank Mill's portrait of Miss Mary Vanderbyl (No. 120) is graceful, and a very admirable and unconventional portrait is that of Mr. William Connal, Junr. (No. 123), by Albert Moore.

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.

Genoa may be reached in thirty-four hours from London. On arriving there we certainly found ourselves in the sunny south, though the wind, as it came down from the Alps, was bitterly cold.

We left London at eight o'clock on a murky February morning; were rocked in the cradle of the deep while crossing to Calais, and passed rapidly on through frozen France to Paris; a good dinner, and on by the night train through a country which, to judge from the temperature of our carriage, must have been Arctic in character. At sunrise next morning the train was slowly ploughing through the Alps for the Mt. Cenis tunnel. At the town of Modane, near the summit, baggage was examined, and the short moments allowed for breakfast were consumed by an altercation with the Customs upon their seizing all our photographic materials, and carrying them off to be weighed. A duty of five francs was imposed, and much time was lost over biting and examining a good English half sovereign, and in finding change. Sandwiches and wine were hastily purchased, and the train proceeded for Turin. Snow descended, and, to all appearance, we might have been travelling through Scotland in winter. A warm dinner in Turin station at two p.m. much comforted the inner man for the rest of the journey. Snow continued to fall, but on emerging from a long tunnel in the Apennines we left it behind, to be seen no more but on the tops of mountains.

Changes are going on in Genoa, as in most other large towns. Modern ugly buildings are springing up, and the picturesque old arsenal, which was so prominent a feature down by the landing place, is now no more; tall warehouses are springing up in its place. Three years ago we photographed this building, with its high wall, capped by flowering aloes. If the destroying of the arsenal were a sign that the spears were to be turned into pruning hooks, and that wars were to cease, we could forgive the Genoese, but militaryism in Italy is increasing so rapidly that it is in danger of absorbing the life blood of the country.

Genoa rises in the form of a magnificent amphitheatre from its semi-circular harbour; palaces and fine buildings adorn the hills, and the whole is surmounted by double walls and fortifications.

The streets are paved with immense blocks of stone, and are innocent of foot paths; if you value life and property it is well to keep a sharp look-out on all vehicles, as they tear along utterly regardless of foot passengers.

How the multitudes of goats escape is a marvel; these useful animals wander about the streets chewing the cud of patience until milking time, when they pull up at the door of each customer, and the milk is taken in pure and warm from its source, generally in glass tumblers; the goats are very tame, and are provided with fancy wooden collars and bells.

The houses are, in many cases, nine stories high, and in a multitude of narrow streets running down to the harbour; they overhang and come so close together, that the people in opposite houses can shake hands across the way. Warm weather prevails in Genoa during the greater part of the year, and the benefit of this system of building is then felt; these alleys keep sweet and cool, and the houses are seldom dark or gloomy.

STREET IN GENOA.

Washing day seems to come round frequently, and then the slums present an appearance as of places gaily decorated with bunting for a Royal procession. An inscription in the cathedral affirms that this ancient town was founded by a grandson of Noah named Janus. The cathedral is mostly in the Gothic style, and was chiefly built about 1100, and restored about two hundred years afterwards. It is built of black and white marble in alternate layers; it has a triple portal, with deeply recessed pointed arches. The interior is most imposing, but as a crowded service was on at the time of our visit, no photo could be taken. The interior of the church of the Annunziata is one of the finest in Genoa, being a mass of coloured marbles and gilding. While photographing here a small boy accosted us in good English; he became our guide to the Campo Santo, a few miles outside the city, and obtained leave for

THE CAMPO SANTO.

us to photograph there. The drive from the city commands fine views of the surrounding mountains, and of the aquaduct, which, like a great snake, lies along their sides, supplying excellent water to Genoa.

Long corridors run round this most beautiful of cemeteries, and many of the marble monuments are highly artistic, being the work of first-rate sculptors. Some of the tombstones have representations of the deceased carved on an insignificant marble medallion, while below, the sculptor portrays his skill in the life-sized figure of the mourning widow in full-flounced dress, laced head-gear, and pocket handkerchief. There is variety to suit all tastes, from the life-sized family group in white marble, weeping around the dying bed of the husband and father, to the monuments with the exquisite figure of Christ with outstretched hands; the angel with folded wings; and the statue of Time as an old man with folded arms and wings, and a countenance expressive of deep solemnity of thought.

One of the most popular is the figure of a little girl—"Ada Carena." The background is so hung with wreaths as somewhat to mar the effect in a photograph.

The mother lifting an infant to the face of its father is an uncommon and pretty piece of sculpture.

A boat on the sea forms an ornament on the tomb of an admiral.

Altogether there is a great mixture of styles, from the classical figure to the modern tall hat. The chapel and corridors help to make up a most imposing whole, unequalled by anything of the kind in Italy.

The statue of Columbus near the railway station forms a good subject for photography. Possibly it might be taken by electric light, as it is well illuminated from the station at night.

Our visit to Genoa terminated about twelve days before the earthquake shook her, and we made for her ancient rival, Pisa. The first half of the way is somewhat aggravating. The railway skirts the grand, mountainous coast; but, owing to there being eighty tunnels between Genoa and Spezzia, you are constantly being dazzled by a lovely peep of sea or wooded mountain, to be followed immediately by an Egyptian darkness.

The latter part of the journey is over a wide plain. Before night the train skirts the walls of Pisa. We recognize the form of the grand old leaning tower, and we are soon in a comfortable hotel in the centre of the city.

THE LITERATURE OF PHOTOGRAPHY FOR 1886.

BY W. JEROME HARRISON, F.G.S.

Having brought up my "Bibliography of Photography," as far as Class I.—printed books—is concerned, to the end of 1885, I now propose to deal briefly with the literature of that part of the subject for the year 1886.

Class I.—Printed Books.

Abney, Capt., W. de W.: Instruction in Photography; Seventh Edition, 8vo.; pp. viii. and 386; illustrated. Piper and Carter, Furnival Street; 3s. 6d.

Anon.: The A B C of Modern (Dry-Plate) Photography; 21st Edition; London Stereoscopic Company, 110, Regent Street; 1s.

——— : The Principles and Practice of Harmonious Colouring in Oil, Water, and Photographic Colours, Especially as Applied to Photographs on Canvas, Paper, Glass, Silver Plate, &c. By an Artist-Photographer. Generally re-written and revised to present date. Fourteenth Edition; 12mo, pp. xi. and 115. Newman, 24, Soho Square; 1s. (Newman's useful catalogues of colours &c., are appended.)

——— : Practical Guide to Photography; Third Edition; 8vo, 229 pp., illustrated. Marion and Co., 22, Soho Square; 2s. 6d.

——— : Beginners' Guide to Photography; showing how to buy a camera, and how to use it. By a Fellow of the Chemical Society. 12mo, pp. 72, with 34 wood-cuts; Lejeune and Perken, 101, Hatton Garden; 1s.

Brannt, W. T., and Wahl, W. H.; The Techno-Chemical Receipt Book; 8vo, pp. xxxi. and 495, with 78 engravings. Sampson Low, 188, Fleet Street; 12s. 6d. (This is an American book, "edited from the German"; but we include it because it also bears a London publisher's name on its title-page. Photography occupies pp. 298 to 308; but many of the other receipts would also be useful to photographers. The book is, in fact, a sort of "enquire within upon everything."

Brown, W. N.: A Practical Manual of Wood-Engraving; with a Brief Account of the History of the Art: 12mo., pp. x. and 70; also 33 wood-cuts; Lockwood and Co., 70, Stationers' Hall Court, Ludgate Hill; 2s. (Includes Photographing on Wood; pp. 65-8.)

Burton, W. K.: Modern Photography; Comprising Practical Instructions in Working Gelatine Dry Plates, Printing, &c.; Sixth and Enlarged Edition; 12mo., pp. iv. and 172; illustrated. Piper and Carter, 5, Furnival Street; 1s.

Dallmeyer, J. H.: On the Choice and Use of Photographic Lenses; Sixth Edition, 8vo., 43 pp., with Preface by Thomas R. Dallmeyer; Dallmeyer, 19, Bloomsbury Street; 1s.

Hepworth, T. C.: Photography for Amateurs; Second and Enlarged Edition; 12mo., 176 pp., 32 wood-cuts. Cassell and Co., Ludgate Hill; 1s.; cloth 1s. 6d.

Hogg, Jabez: The Microscope, its History, Construction, and Applications. Eleventh Edition; (Application of photography to the microscope, pp. 157-161); 8vo., 764 pp., 355 woodcuts, and eight coloured plates; G. Routledge and Sons, 7s. 6d. The first edition of this book appeared in 1854.

Jennings, I. H. (late Assistant-Master in the High School, Nottingham): Photo-Micrography; or, How to Photograph Microscopic Objects. Also a Chapter on preparing Bacteria, by Dr. R. L. Maddox; 8vo, pp. 128, illustrated; Piper and Carter, 5, Furnival Street. 3s.

Johnson, Robert: A Complete Treatise on the Art of Retouching Photographic Negatives, and Clear Directions how to Finish and Colour Photographs; large 8vo.; 87 pp., eight plates; Marion & Co., 22, Soho Square. 2s.

Lock, C. G. Warneford: Workshop Receipts; Fourth Series. E. and F. N. Spon, 125, Strand; 5s. Includes a treatise of 92 pp. on photography.

Pizzighelli, Capt., and Hubl, Baron A.: Platinotype. Translated by the late J. F. Iselin, M.A., and edited by Capt. W. de W. Abney. (Reprinted from the *Photographic Journal*, 1883); 12mo., 63 pp., 4 woodcuts; Harrison and Sons, Pall Mall. 2s.

Thornton, J. E.: Tables for Calculating Exposures. Revised and adapted from Platt's Tables by special permission. Card and fly-sheet; in cloth 6d., stouter cover, 9d.; Thornton, 3, New Lorne Street, Moss Side, Manchester.

Vevers, C. C.: Practical Amateur Photography; 12mo., 50pp., illustrated; with sheet of gummed labels at end. Published by the Author, Horsforth, Leeds; 6d.

Wilkinson, W. T.: Photo-Engraving on Zinc and Copper, in Line and Half-Tone; and Photo-Lithography; a Practical Manual, with an Appendix. 8vo., 115 pp., 3 wood-cuts; published by the Author, North Parade, Otley, Yorkshire; 5/.

Wood, H. A. (edited by): A Photograph: and How to Take It; By "One Who Knows"; 8vo.; 18 pp. (with catalogue appended), Horne, Thornthwaite, and Wood, 416, Strand.

Wyles, Benjamin: Instructions for Beginners in Photography; with preface by J. H. Stone; cr. 8vo., pp. xii. and 117; illustrated. Scientific Publishing Co., 22, Buckingham Street, Strand; 1s., cloth 1s. 6d.

This gives us a total of twenty books, of which, however, eleven only are now published for the first time, the other nine being "new editions." A Mr. Tully also advertised a small book on photography; but not having taken a note of it at the time, its title has escaped me; perhaps the author (or any one possessing the book) will kindly communicate with me if he sees this. I should also be glad of information as to any other omissions, either in this or former lists.

THEORETICAL CHEMISTRY IN ITS PRACTICAL BEARINGS ON PHOTOGRAPHY.

BY RALPH W. ROBINSON.

V.—Development.

Whatever be the nature of the latent image, it is certain that when the developer acts on it the silver is reduced to the metallic state, and the halogen set free to combine with some other body. In chemical language, the developer undergoes oxidation at the expense of the silver compound. It may seem strange, at first sight, that the term "de-oxidation" should be used in connection with a body—such as silver sub-bromide, for instance—which contains no oxygen; and it will be advisable here to explain the meaning of oxidation and de-oxidation. The word oxygen means generator of acids, so called because, at the time of its discovery, it was the only generator of acids known, or, at least, recognised. We now know that all the negative elements possess this property to a greater or less extent. The addition of a negative element to a body always tends to the production of an acid. If the body is already an acid, the addition of such an element increases its acidity; if a base, its basicity is reduced. Some of the metals form several oxides—for instance, iron forms FeO and Fe_2O_3. FeO very readily oxidizes to the less basic oxide Fe_2O_3. Each of these oxides has corresponding to it a series of salts, of which $Fe\,Cl_2$ and $Fe_2\,Cl_6$ are instances. By comparing the equations,

$$2FeO + O = Fe_2O_3$$

and

$$2FeCl_2 + Cl_2 = Fe_2Cl_6$$

it will be seen that the conversion of FeO into Fe_4O_3, and $FeCl_2$ into $Fe_2\,Cl_6$, are perfectly analogous. To all such actions, therefore, the term oxidation is applied, and to the reverse action—the conversion of Fe_2Cl_6 into $FeCl_2$, and similar cases—de-oxidation.

It will now be readily understood that the presence of an acid tends to retard oxidation, while the presence of an alkali encourages it. These properties are made use of in controlling the action of different developers.

There are three different classes of developers: (1) Iron, or pyrogallic acid, restrained with acid, used for wet plates; (2) Pyrogallic acid, accelerated with an alkali; (3) An organic iron salt in an almost neutral condition.

1. The usual form of this developer is ferrous sulphate, restrained with acetic acid. Ferrous sulphate acts on silver nitrate in this way:—

$$6AgNO_3 + 6FeSO_4 = 3Ag_2 + 2Fe_2(SO_4)_3 + Fe_2(NO_3)_6$$

That is, the silver nitrate is reduced to the metallic state, and ferrous sulphate is oxidised to ferric sulphate and ferric nitrate. When the two bodies act on one another in the absence of any restraining body the reaction takes place extremely rapidly; hence in the development of a wet plate sufficient acid is added to keep development under control, and prevent the plate fogging. As the silver is reduced, the particles are precipitated on those portions of the sensitive haloid in the film which have been reduced to sub-haloid by light, and the image is thus built up. Without the restraining acid, the action taking place very rapidly, the silver would be deposited over the whole surface of the film, and general fog be produced.

2. Alkaline development is only applicable to plates which contain the whole of the silver compound in the insoluble state; for were a soluble silver salt, such as the nitrate, present, it would, as appeared above, immediately be reduced to the metallic state. It is also obvious that iron cannot be used in conjunction with an alkali, iron being precipitated from its solutions by such bodies. The alkaline developer consists, then, of pyrogallic acid, an alkali, and a restrainer such as a soluble bromide, citrate, &c. The nature of the chemical action of the restrainer has not, I believe, been satisfactorily explained. Pyrogallic acid has not sufficient deoxidising power to have

much effect on an exposed dry plate alone, but the addition of an alkali has the property of tremendously increasing this power; the action being so strong, if more than a certain proportion of alkali is added, that not only the latent image, but also the unexposed haloid, is directly acted upon.

The alkali and restrainer, working, as it were, in opposite directions, give us, by varying their proportions to one another, great control over development.

By the sub-bromide theory the appearance and building up of the latent image is explained in this way:—First the action of light reduces a minute portion of the silver haloid to sub-haloid. The developer, acting on this sub-haloid, liberates silver, the halogen taking the place of oxygen in the alkali, while the oxygen replaced in the alkali is taken up by the pyrogallic acid. The reactions are represented thus—$\overline{H}$ being used to represent the halogen, and M the metal of the alkali:—

$$Ag_2\overline{H} = Ag_2 + \overline{H}$$

$$2MHO + 2\overline{H} = 2M\overline{H} + O + H_2O^*$$

One half of the liberated silver goes directly towards forming the image, while the other half combines with silver haloid, forming a fresh particle of sub-bromide; which in its turn is reduced, and so on, each circle of reactions adding one atom of silver to the image. It might naturally be supposed that this action might be carried on by prolonged contact of the developer until the whole of the silver in the film were reduced to the metallic state, and the result be one dense deposit instead of an image. There is, however, a time when no further action takes place, a clear and correct explanation of which would be very interesting.

3. The action of an organic ferrous salt is more simple than that of the alkaline pyrogallic developer. We have the reduction of the silver to the metallic state accompanied by the partial oxidation of the ferrous salt, the image being built up in the same way as in alkaline development. For instance, using ferrous oxalate, and assuming the latent image to consist of silver sub-haloid, the reaction takes place in this way—

$$3FeC_2O_4 + 2Ag_2\overline{H} = Fe_2(C_2O_4)_3 + Fe\overline{H}_2 + 4Ag.$$

There is one curious phenomenon connected with the exposure and development of a plate which may be explained here, that is the *reversal of the image*, the action of the developer producing a positive instead of a negative image. It is produced by a very excessive exposure, and is explained by the oxidising action of the halogen set free by the action of light. For instance, in a gelatine plate the bromine set free acts on the gelatine with formation of hydroxyl, a very powerful oxidising agent. This being formed to the greatest extent in the parts of the film on which the greatest amount of light has fallen, here re-oxidises the reduced silver compound, and destroys the developable image.

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A PLEA FOR OUTDOOR MEETINGS.

BY JAMES CRIGHTON.†

IT is of course well known that the aim and object of a Society is to further the interests of that particular branch of science to which it is allied, and periodical meetings are held to consider matters relating thereto. At these meetings it is only in most cases the theoretical aspect that can be taken up, leaving the practical to the time and conditions natural and necessary for demonstration, or, perhaps more definitely speaking, to the time and conditions when the theory is put in practice. Other and not less inferior objects are gained by such association of kindred spirits and devotees in the same line of research. A bond of brotherhood, so to speak, is engendered which is calculated to promote the cause at heart, and a community of ideas is formed which grows and lasts. Friendships are made which separation does not annul. Experiences are given by men of outstanding ability whose sage council and thorough practical knowledge are of the utmost service to those who, it may be, are only on the threshold, and with timorous steps feeling their way to attain to some degree of perfection in what they have put their hands to—men to whom, because of their skill, we make profound obeisance, and cherish the memory of others who have been removed from this sublunary sphere, giving us all an encouragement to emulate them.

Photography has now come to a great climax—a climax approaching perfection. One need only refer back to a paper read to this Society in the month of February last to see how the art—for art I would call it—is developed at the present day. In that paper it was clearly shown that it was no mere plates, chemicals, &c., that were required, but the artistic eye and judgment to produce a *picture*.

I know right well that photography is decried among artists of the brush, but I know equally well that artists—I would not say all artists—are deeply indebted to our art as an aid, and use it as such. In this I have no fault to find with them, but I think they should be honest, and admit their indebtedness.

It was my privilege last year to be a member of the Fine Art Committee of the International Exhibition, where photography was classed as a fine art; said committee included artists, so-called, and the manner in which some of them—aye, and those, too, who were neither the one thing nor the other, but who prided themselves on having a smattering of what was art—spoke of and acted towards photography was galling to me. "It was mechanical," "There is no art in it," &c., &c.—in short, photography was not "to come between the wind and their nobility," and would have stood a good chance of being shunted, but for the determined stand taken by those who resolutely championed the cause. Is photography mechanical? So is painting. Do artists (some of them) study what will make a pleasing picture? So do photographers (some of them). Is judgment necessary in blending and applying the colours? So a knowledge of chemistry is required to mix and apply that which will bring out the latent image. Do artists strive to infuse poetry into their subjects? So do photographers. Do artists aim at originality of treatment? So do photographers. I admit that the charming colour and artistic grouping of a Lockhart, the peaceful and natural effects of a M'Kay, and the rugged grandeur of a Smart are worthy of all praise, and the artistic eye and deftly-applied brush have done their part well; but are the studies of Mora, Jennings, Wilson, Valentine, and a host of others, professional and amateur, to be looked at with the half-shut eye, and their delineations of mind and matter dubbed as mere mechanical?

But you will be asking, what has all this to do with "Outdoor Meetings"? Much every way, I reply, for I wish to impress on your minds, as I would on my own, the need there is to cultivate our art, and each in his sphere to do his utmost to further it; and this end will be gained by taking advantage of all the opportunities afforded to add to our knowledge. I know that much useful information is imparted to one another at monthly meetings; but, for the most part, it is the theoretical that we discuss. We need occasionally a "march out," some field exercise, and such a desideratum as I have indicated will, I feel assured, be the result of attending such gatherings as our outdoor meetings.

Some of our younger members may not be aware of the nature of these meetings; allow me, therefore, to explain that it is simply a few of our workers agreeing on a given day to pack up our cameras, &c., and visit either by road or rail some place where pictures may be got, and the benefits arising from such a commingling are manifold. We there meet the veteran in our art with matured judgment and artistic tastes. We discuss matters photographic. This and the other process is commented on. The latest appliances are judged: this camera has too many movements; a certain lens has its defects; So-and so's mode of development finds favour with some, while with others it has not proved so satisfactory; shutters are discussed, but on this point there is great diversity of opinion, as there is also very great diversity of "forms"; so it is thought advisable by some to let the subject "drop." Difficulties of a general kind are brought up, and information imparted which throws new light on matters erewhile seen but "through a glass darkly." The articles and correspondence in the journals are reviewed; the tilt between the Earl of Craigcleuch and the Chief of the R.S.A. to decide on the point as to whether "the human form divine" should be reproduced *au naturel* or have the marks of time obliterated; whether the "higher spheres" unimpressed with "cloudy skies" should have the want supplied by other means; and whether Messrs. Diston, Bruce, and Co. are truly *en rapport* with the canons of art in their compositions. The verdict of the jury on all the counts is that a "judicious blend" is recommended, and while the reasoning faculties are thus occupied, the ocular are not idle, for as we journey on to our destination the scenes we pass are noted, and they suggest subjects for another occasion.

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* Other intermediate reactions may take place, but this equation gives the final practical result of the change.

† Abstract of a paper read before the Edinburgh Photographic Society.

Our destination is reached; it may be a fishing village. A council is held; "mine host" is consulted, and arrangements are made for an attack on his larder later on, at which time all are expected to be in their places. Our advent in the locality is looked upon in a musical light; we are taken for the German band, and anon, when our cameras are uncased and distended, a very intelligent little boy calls on his brother Sandy to come and see the concertina-man. An old chap, who, from appearance, has weathered many a storm on sea and land, takes stock of us from head to foot, and then makes bold to ask if we are "prospecting for a new harbour." A little lassie, the most knowing of all, is sent by her mother to ask "hoo muckle we chairge for cairds." But we are not discouraged by the various ideas of our visit; we reply to the interrogators civilly.

How does it happen that these gatherings, which at one time were pretty well attended, have been for some years neglected? It appears to me that we are not keeping pace with the times—that there is a lapsing from some of the old traditions, and that in this matter we are not maintaining the prestige of the Society. I do not mean to affirm that in consequence of this the Society is less prosperous, less influential, or less harmonious—facts would belie any such idea, for never before did more peace and prosperity exist among us; neither do I even hint that because of our defection on this score our art has suffered, for the work done by the members during the season, as displayed each November, show us it has not—still I would advocate what I have already indicated, that the benefits arising from a few "assembling themselves together" is, I think, the "more excellent way."

In conclusion, I would offer the following suggestion for the consideration of the Council, namely, that at the close of the season some reward should be given to the best and second best series of six pictures taken at the outdoor meetings.

◆

Notes.

Photography by moonlight is not altogether a novelty, but it is a new thing to see such a perfect photograph as Hector Colard has obtained by exposing for an hour and a quarter. Our supplement, besides showing Colard's photograph, also illustrates the perfection to which the "*Société des Arts Graphiques*" of Brussels has brought the process of phototypographic engraving.

The photograph in question represents the Communal School, No. 13, at Brussels, a red brick building with white and blue stone dressings, and the exposure was made with an 8 by 10 Dallmeyer rapid rectilinear working at $\frac{f}{7 \cdot 71}$. The night (February 9th last) was clear and frosty, and it was one day after full moon. Numerous details, invisible to the eye, appear in the photograph.

A very representative show of photographs and photographic appliances was organised by the Leeds Photographic Society on the occasion of their *conversazione* held on the 12th instant. Much interest centred around a frame of Daguerreotypes shown by S. A. Warburton, these taking the observer back about half a century. It is said that a Leeds Photographic Society existed in 1850, and that this Society published a photographic periodical. Perhaps J. W. Harrison, who is the most active of our photographic historians, will investigate this matter, and bring the old journal to light—if, indeed, any copies exist.

What Walter Crane has to say on "The Importance of the Applied Arts, and their Relation to Common Life," will probably interest many of our readers, and those wishing to hear his lecture should apply to the secretary of the Society of Arts, John Street, Adelphi, for admission on the evening of May 24. Professor Herkomer will preside.

If we are to believe the Professional and Trades' Section of the Ealing, Acton, Hanwell, Gunnersbury, and Chiswick Directory, just issued by Messrs. Kelly and Co., of Great Queen Street, there are only two photographers in the whole of the above-mentioned districts; but we do not believe the Directory. At one time Kelly's Directories were representations of the districts included, and we have known the time when those wishing to get a list of photographers advantageously referred to Kelly's books. If the Directories are to be like that to which we have referred, the sooner we have official Directories the better. The Postal authorities might easily untertake their production and publication.

Many of the principal pictures at the Academy have been sold, and already more money has been spent in purchases than was received during the whole time the Academy was opened last year.

It is said there has been lately added to the local bye-laws of one of the most popular of our seaside towns a regulation which prohibits the boatmen from "touting" for custom. If this be true, the itinerant photographer must feel rather uncomfortable, because he cannot tell how long it will be before the stern town council will pounce down upon him and threaten him with all sorts of pains and penalties if he ventures to suggest that it is "a beautiful day for having your photo. taken—you and the young lady, sir—make a lovely group." We trust that the town councils of seaside pleasure resorts will be merciful. So far as our personal experience has gone, we have always found the beach photographer the politest and most unobtrusive of individuals.

The *Whitehall Review* starts a paragraph by remarking that "photographs have quite superseded the illustrated album," and goes on to relate how a young lady is working at a curious series of sketches which are intended to decorate a small gallery in the country. These sketches illustrate notable episodes in the artist's life, commencing with her portrait in her christening robe, and proceeding upwards to her portrait as dressed for her first interview with her betrothed, and so on, to the crowning picture of herself in her wedding gown, and a corner of the village church where she was married thrown in as a background. The artist is under thirty years of age, and good looking; but

PATENT OFFICE

she declares her intention of reproducing herself as she grows older, and possibly plainer, with the utmost fidelity.

Here is decidedly a new use for family photographs, especially as the proficiency which amateurs have acquired ought to enable photography to enter into all the principal events connected with one's domestic history. It is, perhaps, not worth while to start before the period of vaccination; but the pictures might well begin with this, and continue by representing the donning of the "short coat," the discovery of the first tooth, the first pair of trousers of a male, and the first long frock of a female, and so on. There is, however, one point connected with the sketches of the young lady referred to by our contemporary about which we are doubtful. Conscientious she may be as to copying her photograph literally; but how about the photograph itself? If it makes her look *too* plain in the first instance, will she not do one of two things—either give up the idea, or persevere in being photographed until she secures a portrait (with the skilful aid of the retoucher) which pleases her?

It is not very clear why the subject of the best method of enlargement for amateurs discussed at the last meeting of the Photographic Society was complicated by T. S. Davis' explanation as to what the Committee meant when they framed the question. The question was a very good one as it stood: how small a picture could be hung at an exhibition, and yet be "imposing"—to quote Mr. Davis' somewhat ambiguous word—was a consideration really outside the mark. At the same time, the question of size is one well worthy of discussion. It would be a mistake if any impression got abroad that the Council or the Hanging Committee were predisposed in favour of pictures of not less than 12 by 9, and that in consequence those of less dimensions are placed in insignificant positions because they are not "imposing." Some years ago there was a craze for large heads, and the result was an ugliness about the exhibition from which of late it has been happily free. The question, it is true, as presented to the meeting, was supposed to extend only to landscapes, but exhibitors will not stop to consider the subject if they are inclined to go in for "imposing" pictures.

The charm of the beautiful pictures of the Manners Gordon and Gale school is in their refinement and delicacy, and it is open to doubt, as hinted at by some of the speakers at the meeting, whether by being made more "imposing" they would not lose this charm. The fact that Mr. Gale had one of his most artistic pictures enlarged proves nothing. Many photographers like to see how some of their small pictures look when enlarged, but they would not think of comparing the two together, because there are no points of comparison. The comparison lies between the enlargement and a picture of the same size taken direct. It is almost a pity that any standard size for exhibition was mentioned. As to proportion, that is a different matter altogether. There is little doubt that photographs are frequently spoilt by the want of balance between the height and length, and also by the inappropriateness of the shape to the subject; but these points have nothing to do with mere size. Anyway, it is to be hoped that intending exhibitors will not take Mr. Davis' advice universally, and produce nothing but "imposing" pictures.

In the early days of dry plates, the ingenious amateur, who was always trying experiments, had some scope for his inventive powers. Albumen in a dozen different ways, tannin, coffee, tea, beer, and ever so many other ingredients were dragged in as preservatives. It is pretty certain that had the new process for extracting albumen from slugs and snails been devised years ago, we should have had some enthusiastic person preparing the slug-and-snail plate. Manufacturers of albumenized paper may perhaps like to know that when eggs fail them they can fall back upon slugs and snails.

In the *Century* magazine for this month appears a very interesting article relative to the photographing of the mummies of the Pharoahs, copies of which photographs are now attracting much attention in the windows of the various London print dealers. It appears that the burial-place of Rameses II., known as Pharoah of the Oppression—that is to say, the Pharoah in whose reign the Jews escaped from bondage—was unknown until about the middle of last year. Professor Maspero, Director-General of the Bûlâq Museum, suspecting, from the relics of the Rameses period which tourists were continually purchasing from Arabs, that the whereabouts of the tomb must be known, extracted the secret from a native whom he had arrested by a judicious mixture of the bastinado and bribes. The place necessitated a very arduous journey, but the search was rewarded by the discovery of the body of Rameses, and of the bodies of some forty other Egyptian kings and queens. The mummies were photographed in the Museum immediately they were unwrapped, and subsequently the camera was taken to the scene and various other photographs were taken. The photograph of Rameses shows an undoubted likeness to the face on the Southern column at the great Temple of Abou Timbel, of which, also, a photograph has been taken.

Review.

THE PRINCIPLES AND PRACTICE OF PHOTOGRAPHY. By Jabez Hughes. Fourteenth edition. Revised by J. Werge. Price one shilling. (*London: Simpkin, Marshall, and Co.,* 4, *Stationers' Hall Court; and J. Werge,* 11a, *Berner's Street, W.* Preface dated April, 1887.)

Far back into the memories of the older photographers, is the remembrance of Jabez Hughes' little book as a handy guide to everyday work, a book consisting almost entirely of condensed information, and in which anything of the nature of padding is rigorously excluded. It is a concise and practical guide to the collodion process, printing, making ferrotypes, and to the preparation and use of gelatino-bromide plates, besides a number of minor points. The chapters on defects, failures, and remedies are, for the purposes of reference, worth all the money.

Guide to the Science of Photo-Micrography. By Edward C. Bousfield, L.R.C.P. Price one shilling. (*London*, 1887 : *Kent and Co.*, 23, *Paternoster Row.*)

Here we have seventy pages of very clearly written descriptive matter, which should serve, at any rate, to launch the beginner fairly on the way in photo-micrographic work; indeed, the author does not profess to approach to the limits of his subject.

In the case of another edition, it might be worth while to add a few diagrams of apparatus.

DALE ABBEY.

BY RICHARD KEENE.*

Fifty years ago Richard Howitt, the poet, a native of the neighbouring village of Heanor, wrote some verses entitled "The Hermit of Dale," in which he says:—

> "O Deepdale! lovely is thy land
> With pasturing herd and flock;
> And lovely is thy Hermitage,
> Cut in the solid rock.
>
> "A cheerful place of healthful life—
> A spot of Nature's love;
> With greenest grass up to the door,
> And crowned with trees above.
>
> "With that one arch before thee set—
> That one old Abbey window fair;
> The only wreck of the rich Fane
> That restless time would spare."

And there is little change here to this day. Dale Abbey lies buried amongst the woods and fields in a secluded valley, far away from the "madding crowd"; and though the Great Northern Railway has made it more accessible than heretofore, there is a quaintness about it speaking of the past, and realising the idea of an old English village enjoying the calm and tranquility of bygone years. It is true that the gray old guest-house disappeared nearly four years ago to make room for the present building—a change to be deplored by every lover of the beautiful, especially as it might have been carefully repaired, and its old form and features retained. You will see by these photographs—some of them taken only just *one* day before the work of destruction commenced—what a charming old place it was. The field where stands the old Abbey window has been excavated, and the foundations of the walls, pillars, &c., exposed to view, increasing our knowledge of the building, and bringing to light many matters with which we were not previously acquainted. The old yew trees, coeval with the sacred edifice near which they stood, have gradually disappeared, and not a vestige of them now remains. I have brought photographs of these subjects, taken before and after the diggings. The churchyard was formerly hedged round on the north and west sides, and the brook connecting the old fish-ponds was crossed by a little ford and a plank foot-bridge, instead of the arched bridge as now. For nearly half a century have I made constant pilgrimages to Dale Abbey, and these are the principal changes I note. The old-world place remains much as it was when the poet wrote—

> "Here, as to all the world unknown,
> A sage seclusion dost thou keep;
> And here Antiquity enjoys
> A deep and mossy sleep."

This seclusion was somewhat rudely, though reverently, disturbed on the 9th of September, 1878, by some of the members of the Derbyshire Archæological Society, when the excavations commenced, and were again renewed on the 2nd of July in the following year. The results of our labours—for I was one of the disturbers—you will see on the site, and those who take interest in archæological matters may find an account of our diggings in Vols. I. and II. of the Society's Journal.

The Abbey of the Blessed Virgin Mary at Dale was founded about 1160, by Serlo de Grendon, Lord of Bradley, as a Monastery of Austin Canons, who were afterwards replaced by Præmonstratensians. Indeed, there were many changes which I have not time to tell of. Some of the Canons, being idle and addicted to the pleasures of the chase, were turned out by the King; others could not live there in poverty, after hunting the deer was stopped, so returned to their former homes. Towards the close of the 12th century, however, some members of the De Grendon family endowed the Monastery, and placed it in charge of nine Canons from Newhouse, in Lincolnshire; and from this time, under eighteen successive Abbots, the place prospered and increased in wealth and lands, and at the dissolution of Monastries in 1539 it had sixteen Canons with a yearly revenue of £144 4s., equal to about £3,000 at the present time. The original structure has almost entirely disappeared, and the remains you now see are parts of a magnificent building begun about the year 1200, with later additions extending over nearly two centuries. We shall not have time for a detailed description, for I must say a few words about the Hermitage on the hill-side yonder; suffice it, that the Abbey of Dale was once a noble building of great extent and beauty, as you may judge from the disclosed foundations, the grand old window-arch, and other remnants still standing *in situ*—as parts of the kitchen and the gate-house.

One of the Canons of the Abbey has left us a most interesting chronicle, the original of which is in the British Museum. A good translation of it will be found in Glover's *History of Derbyshire*. This Canon, Thomas de Musca, divides his chronicle into thirteen chapters, each beginning with one of the letters of his name, forming a sort of acrostic. Chapter III., "*Concerning the Baker who became a Hermit; the First Inhabitant of Deepdale*," gives an account of the origin of the Hermitage, as related to him by "a noble matron the Lady Matilda de Salicosa-Mara," one of the founders of the monastery. I wish there was time to give this legend in his own words. It relates that a baker of Derby, Cornelius by name, and living in the parish of S. Mary, "a religious man, fearing the Lord, and much intent upon alms and good works," fell asleep "on a certain day in autumn," at the hour of noon, when the Blessed Virgin Mary appeared unto him in a vision, and bade him, if he were disposed to become a perfect man, to leave all his worldly possessions behind him, and go to Deepdale, there to serve her and her son in solitude. He was miraculously directed to the place, to which he was previously an entire stranger, by a maiden, whose mother he overheard directing her to drive some calves there. He found it a cold, marshy, and desolate place, and here "he served God day and night, in hunger and thirst, in cold and meditation."

> "Here in the hollow oak he made
> His dwelling night and day,
> Whilst he, with unrelenting hands,
> The hard rock cut away."

I need not describe the Hermitage, for you have seen it, and got some good views of it too, I hope. The country round about is much changed since the Derby baker came here, but the Hermitage is very little altered, though a stockinger did once make it his home. The surrounding trees are of comparatively recent growth, but here and there you will find a hoary trunk, the last lingering relics of the primeval woods. In the dim old days of which I have been speaking, the valley of Deepdale was a wild and lonely spot in the midst of a great forest extending from Derby almost to Nottingham — well stocked, we may imagine, with deer and other wild animals. However that may be, "a certain potent lord, of the name of Radalphus, the son of Geremund, and lord of the moiety of lands of Ockebrook and Alvaston," returning from Normandy, took it into his head to have a little sport in these woods, and whilst hunting, was attracted by the smoke of the poor hermit's fire curling up through the trees, and wished to know who dared, without licence, make a "mansion" in his forest. But on seeing the wretched Cornelius, clothed in rags and skins, he was "smitten at the heart," and granted him the place, together with the tithe of the mill at Borrowash, for his sustenance. Here he battled bravely with the devil, who envied this good man his peaceful and religious life. Cornelius also suffered greatly from the want of water, and discovered a spring in the deeper valley, close by which he built an oratory in honour of God and the Blessed Virgin, where "he wore away the sufferings of his life, laudably, in the service of God." The well is still to be seen at the bottom of the orchard, to the north-east of the church, and is still known as the Hermit's Well. Another legend in the same chronicle relates how the site of the Abbey was fixed upon through the vision of "one Uthlagus, a very famous man," who was sleeping and dreaming on Lyndersyke, the hill you see to the west of the Abbey, when he beheld a golden cross standing in that spot where the foundation was afterwards laid.

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* Communication to the Derby Photographic Society.

There is a tradition extant amongst the inhabitants of Dale, that so long as the Abbey arch stands, they are exempted from payment of tithe. Another, that treasure of great value lies buried in the Abbey-fields, though we came not across it in our diggings; graves there were in plenty,[*] and archæological treasures not a few, but *no* treasure-trove! The last and most popular legend I shall give you, is that telling of how the king granted to the Abbot of Dale as much land as he could encircle in one day with a plough drawn by deer caught in the forest, as shown in one of the windows in Morley church, removed from Dale. This window, however, represents the well-known story of S. Robert of Knaresborough, and once adorned the refectory of Dale Abbey.

The quaint old church here, one of the very smallest in England, boasts of great antiquity, and is on the site of the oratory built by the hermit, if, indeed, some parts of it are not of the original structure; and small though it be, you have seen that it has a nave, chancel, side aisle, screen and gallery—the latter of comparatively recent construction, and reached by steps on the *outside* of the building. The pulpit in the corner is certainly not of the "Perpendicular" order, the communion-*table* is unique, and the bishop's chair quite a Brobdingnagian feature in this Lilliputian church. The font, after various vicissitudes, has settled at last in the east end of the aisle. I remember the time when it did duty as a flower-pot in the vicar's garden at Stanton: then it was brought here and placed in the north-west corner of the churchyard, close by the gate; and finally came to rest in its present position. The carving on two of its sides of the Virgin and Child, and the Crucifixion, is of good design and execution. This font belonged to the Abbey. The guest-house next door once seemed to form part and parcel of this sacred edifice, as you may see in these old photographs, and the writer of "All About Derbyshire" says. "I defy you to decide where the church ends and the house begins." There is no such difficulty now. In the old house you might have seen a blocked-up doorway, once opening into the church. It was closed because the singers and others sometimes got tipsy. For you must know it was a publichouse at the beginning of this century, called the "Blue Bell." I have seen the signboard.

And now I must close my rambling recollections by telling you that relics of the Abbey exist at Radbourne, Chaddesden, and Morley churches. In the latter are the interesting series of stained glass windows I have before named. Morley and Breadsall would make another good afternoon's work for us, as some pretty bits could be got at either place, though the latter has suffered much from an artist's point of view since the railway-station perched itself there. I do not go so far as Ruskin in my distaste for railways—for do they not carry us easily and cheaply to places we should never have dreamt of seeing without their aid?—but I would recommend you to hasten with your cameras to any historical or lovely spot when it is threatened with a railway station for its near neighbour, for as surely as it is built, so surely will hordes of trippers devastate the neighbourhood, and ugly houses rise around to deform the landscape. Just one more piece of advice, and I am done. Photograph any and every old church or other ancient building you may come across before the "restorers" fall upon it and take away its beauty. Long may it be before the rude old church of Dale is "restored" and revived, or destroyed as the adjoining house has been!

Patent Intelligence.

Applications for Letters Patent.

6813. John Veda Robinson, 39, Lower Sackville Street, Dublin, for "Improvements in photographic cameras and improvements in stands for same."—10th May, 1887.

6950. Isaac Watts, Arcade Chambers, St. Mary's Gate, Manchester, for "An improved pocket instrument or actinometer, for determining the length of time for exposure of sensitive plates in taking photographic pictures."—12th May, 1887.

7035. Johannes Gaedicke, and Adolph Miethe, 55, Chancery Lane, London, for "An improved magnesium light for photographic purposes."—[Complete Specification].—13th May, 1887.

7121. George Downing, 8, Quality Court, Chancery Lane, Middlesex, for "Improvements in the method of focussing the object glasses of cameras, and in apparatus therefor."—(*Louis Mathieu Berthon*, France.)—16th May, 1887.

Official Abstract of Accepted Complete Specifications.

Serhall, 9155, 1886. "Printing, colouring, and finishing. Vignetting masks: paper printed with non-actinic colours on one or both sides, and rendered transparent by varnishing."

Mayall, 5080, 1887. "Printing, Colouring, and Finishing. Printing and colouring on specially-prepared porcelain or paper, silicon, &c., applied to secure permanency."

Specifications Published.

5793. Jean Baptiste Joseph Journoud, Engineer, of Lyon, in the Republic of France, for "Improvements in plates and the like for photographic purposes."—Dated 28th April, 1886.

Relates to the application of celluloid, xylonite, and the like to photography by using celluloid, xylonite, or the like plates for negatives and positives, as also by replacing the ground glass in the camera by translucent plates of celluloid, xylonite, or the like.

7951. Samuel Dunseith McKellen, 18, Brown Street, Manchester, Watch and Clock and Camera Manufacturer, for "Improvements in photographic cameras."—Dated 15th June, 1886.

The claim is:—1st. In a photographic camera, for the purpose of attaching the dark slide thereto, the use of movable rails or guides, which may be placed nearer to or further apart from each other, in order to allow dark slides of different widths to be inserted between them.

2nd. For the purpose of attaching the dark slide to back of a photograph camera, either in a horizontal or vertical position, the use of removable or detachable rails or guides, which may be placed either horizontally or vertically as required.

4178. Thomas William Nagington, of Stone Street, Solicitor's Clerk, and William Hugh Waring, of 214, Wolverhampton Street, Tailor, both of Dudley, in the county of Worcester, for "An improved construction of rotary album suitable for photographs, memoranda, and the like."—Dated 19th March, 1887.

Relates to a certain improved construction of rotary album suitable for photographs, memoranda, and the like, and has for its object to manufacture such an article in a neat and convenient form and of any desired size; but we prefer to make it in miniature, so that it may be carried in the pocket. The album is constructed in two parts, being preferably a pair of circular or polygonal plates of metal, wood, millboard, or other suitable material, pivotted together at the centre, and each capable of revolution; in one, but preferably in both plates, an aperture of suitable size for displaying a photograph making memoranda, or other purposes, is formed.

The photographs or writing spaces are placed equidistant from each other on the internal faces of the plates, so that by moving the outer plate right or left around the centre when two apertures are formed, two different photographs or fresh spaces for notes may be discovered one at either side.

5932. Joseph Cornelius Heine, trading as Messrs. Haver, Heine, and Sohn, of Schoenenbach, Grand Duchy of Baden, Germany, Manufacturers, for "Improvements in magnesium lamps."—Dated 1st May, 1886.

Relates to certain construction or arrangement of apparatus for burning magnesium wire or ribbon with a constant running for producing regularity of flame and of consumption, with means for removing the ash from the end of the magnesium as consumed, and for collecting it. The feeding is maintained by pneumatic or by electrical appliances fitted upon the base or in proximity to the lamp itself.

The main part consists of a fixed or revolving tube through which the magnesium wire or ribbon is fed by rollers, one of which has a regulating pressure spring for insuring the bite upon the wire.

In connection with the fixed or revolving tube at the mouth of which the magnesium is consumed, is a revolving or fixed cutter to remove the ash, this falling on to a rotating wheel arranged below a fixed grating on to which the ash first falls.

If the apparatus be driven by pneumatic power two flexible bags are fitted to the ends of a tube, and one bag is compressed intermittently by a rotation fusee or wiper, which drives the air through to the other bag, and this by expansion operates a lever provided with spring paul which winds up the driving gear for actuating the feed appliances.

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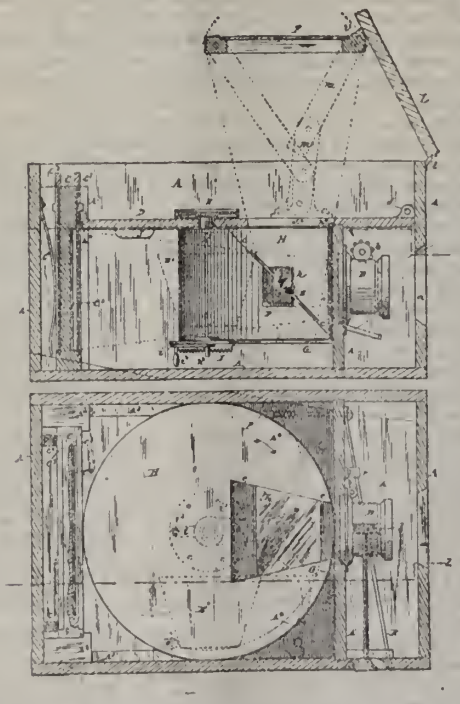
[*] "I have heard it said by a man of veracity, worthy of belief, that more than four hundred warriors lie buried in that place, setting aside others of the nobility and gentry, and a prodigious number of common people."—*Chronicle of Thomas de Musca*, VIII, 6.

3139. Alfred Julius Boult, of 323, High Holborn, in the County of Middlesex, M.I.M.E., for "Improvements in photography and photographic reproduction." (Communicated from abroad by *Albert Sichel*, of New York, United States of America, Merchant.)—Dated 1st March, 1887.
This will be reprinted in its complete form next week.

8010. George Caldwell, 187, West Princess Street, Glasgow, in the County of Lanark, Cabinet Maker, for "An improved changing box or apparatus for storing, carrying, exposing, and changing actinically sensitive films on glass, on paper, or on other material to be employed in obtaining photographic impressions in the camera.—Dated 16th June, 1886.
This will be reprinted in its complete form next week.

Patents Granted in America.

361,672. Walter Clark, New York, N.Y., for "Photographic camera."—Filed October 26, 1886. Serial No. 217,220. (No model.)



Claim.—1. A photographic camera provided with an inner lid D, to which is pivoted a revolving drum containing the focussing mirror, said inner lid being retained in place by a projection on the plate-holder, substantially as described, and for the purposes specified.

2. A photographic camera provided with a revolving drum, mounted on a vertical axis and placed immediately behind the lens, said drum carrying the focussing-mirror, and provided with a window to admit the passage of light at the proper time through the lens to the sensitive plate, as herein described and shown.

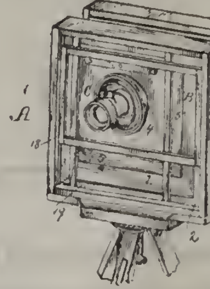
3. In a photographic camera, the hinged lid L and ground-glass plate F, pivoted thereto and raised and supported by the links $m\ m^2\ m^3\ m^4$, the parts being so arranged and adjusted that when raised, the plate F is always at the same distance from the focussing-mirror that the sensitive plate is from said mirror, as herein described and shown.

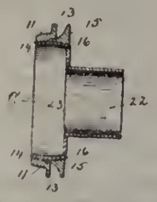
361,387. Simon Wing, Boston, Mass. "Photographic camera."—Filed November 18th, 1886. Serial No. 219,276. (No model).

Claim.—1. The combination, with a camera, of a lens-holder seated in the lens-holder end of the camera by a ball-and-socket connection consisting of a socket in the camera and end piece fitted to the socket formed of segments of a circle taken on planes equidistant from the diameter, whereby the lens-tube can be turned in any direction, substantially as described.

2. The combination, with a camera, of a lens-holder seated in the lens-holder end of the camera by a ball-and-socket connection, and arranged to be shifted across the end of the camera, substantially as described.

3. The combination, with a camera, of a lens-holder formed with a sphero-segmental base and a number of shifting frames to close the end of the camera, and one of said frames carrying the lens-tube with its sphero-segmental base adjustably seated therein, substantially as described.





4. The combination, with the camera, of a number of shifting frames to close the end of the camera, and arranged one above the other, and a lens-tube seated in the outer shifting frame by a ball-and-socket connection, substantially as described.

5. The combination, with a camera, of a number of shifting frames to close the end of the camera, and arranged one above the other, a lens-tube seated in the outer shifting frame, and movable guiding-frames arranged transversely to each other, with the projecting end of the outer shifting frame seated in the square formed by their intersection, substantially as described.

6. The combination, with a camera, of a lens holder or tube provided with a base-ring formed convex in cross-section, and a separable concaved ring-socket to secure it to the camera, said base-ring and ring-socket consisting of segments of a circle taken on planes equidistant from the diameter, whereby the lens-tube can be turned in any direction, substantially as described.

7. The combination, with a camera provided with a concaved ring-seat, of a lens holder or tube having a base formed convex in cross-section to set in the concaved ring-seat, and a clamping ring concaved in its inner surface to set over the base of the lens-tube, and threaded exteriorly to engage with threads on the interior of the concaved ring-seat, substantially as described.

8. The combination, with a camera provided with a detachable concaved ring-seat, of a lens-holder or tube having a base formed convex in cross-section, and provided with a villous covering to set in the concave ring-seat, and a clamping ring concaved in its inner face to set over the base of the lens-tube, and means, substantially as described, for uniting it to the concave ring-seat, substantially as specified.

9. The combination, with a camera, of a lens-holder composed of a number of rectangular frames arranged one upon the other, rectangular spring-metal frames fitted to slide in grooves in the lens-holder frame, and arranged across each other with the top of the uppermost of the first-named rectangular frames arranged in the square in the frame formed by their intersection, and a lens-holder tube having a convex ring-base seated in a concave ring-seat, substantially as described.

361,947. William L. Imlay, Camben, N.J., "Photographic shutter."—Filed May 18th, 1886. Serial No. 202,563. (No model.)

Claim.—1. The combination with the frame or back-board A, having opening B, of the frame or slide C and plate-halder E, having a shutter E′, with opening spring E^2, and the rock-shaft F, having spring G, and arm K, substantially as shown and described.

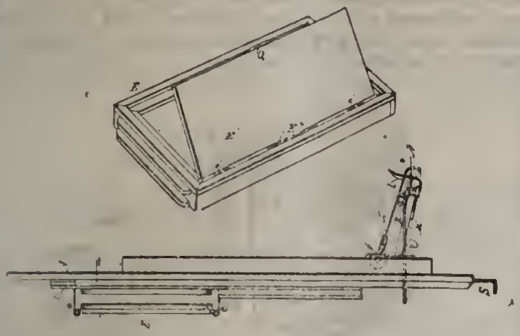
2. The combination with a frame or back-board A, of rock-shaft F, having fast collar I, with arm K, loose collar H, and spring G, substantially as shown and described.

3. The combination with the frame or board A, of shaft F, having arm K, and spring G, spring-latch L, lever N, and connection O, substantially as shown and described.

4. The combination with the board or frame A, of the rock-shaft F, having arm K secured to said shaft, spring G for rocking

said shaft and moving said arm, and a loose collar H on said shaft, said collar having adjusting holes h' and an arm h, whereby the tension of the spring may be adjusted, substantially as shown and described.

5. The combination with the board or frame A, of the slide or frame C, plate-holder E, having shutter E′, rock-shaft F, having spring G and arm K, spring-latch L, lever N, and rod or connection O, said parts being constructed and arranged substantially as shown and described.



6. In a photographing-camera the combination with the back-board of a frame, a plate holder having a hinged shutter opening by spring-action, and a spring actuated arm supported on said board and held by a catch which is released when the shutter drops, thereby liberating the arm and closing the shutter by spring action, substantially as shown and described.

7. The combination with the back-board or frame A, of a plate-holder having a shutter E, a spring-actuated arm K, a catch L, and an adjusting screw R, said screw being located below said arm and adjustable so that the shutter may either be held by the catch when said shutter falls, or be instantly closed after falling, substantially as shown and described.

8. The combination with the back-board A, of a movable or sliding frame C, having a focussing-plate and affording support to a plate-holder, whereby by a sliding action of said frame the focussing-plate may be moved out of focus and the sensitive plate brought into the same position, substantially as shown and described.

9. A photographic camera having a shutter which is opened and closed automatically by or through the movement of the plate-holder to produce instantaneous exposure, substantially as shown and described.

10. A photographic camera in which the sensitive plate is exposed automatically by or through the movement of the plate-holder, as set forth.

11. A photographic camera having a movable frame carrying a focussing-glass and plate-holder with a hinged shutter which opens and closes automatically when the frame is moved and the sensitive plate takes the position of the focussing-plate, substantially as shown and described.

12. A photographic camera having a movable frame and a plate-holder with hinged shutter, said parts operating so that when the frame is moved to bring the sensitive plate into focus the shutter of the plate-holder drops, substantially as shown and described.

13. A photographic camera in which the focussing-plate and plate-holder are adapted to change position, and in which the sensitive plate is automatically exposed when at the focussing-point, substantially as set forth.

THE FASCINATIONS OF PHOTOGRAPHY.

BY W. E. LECK.*

Photography has a great future before it. Already artists are using the camera as an aid to the brush, while its services to the military and scientific engineers are manifold. As a means of recording passing events we have only to look at the recent visit of the Queen to Birmingham, or the unveiling of the statue of Mr. Campbell at Stoke. In this latter instance, not only was an instantaneous picture of the ceremony taken, but had it not been for a few old photographs of the deceased gentleman, the sculptor would have had to depend entirely on a verbal description for the conception of the statue.

In furtherance of the ends of justice, photography plays a most important part, many a criminal having been identified by his portrait. And now detective cameras are made the size and shape of a watch, or in such a form that they may be worn beneath the vest. This is all the more readily obtainable, as the person is not aware of being taken.

In the literary world photo-lithography has established itself as a most valuable adjunct to book illustrating. And, in short, the value of a knowledge of photography is so great that I think we have only to wait a few more years before seeing its principles and practice taught in our schools, not only as an art-science by itself, but as tending to inculcate an artistic conception, and to give a correct idea of the laws of light and shade.

In concluding with a few practical hints to beginners, I must ask the indulgence of the older hands, for the benefit of those who are not already acquainted with them. In practising portraiture it is as well to remember that a light blue or white dress, by coming out white in the finished print, detracts from the beauty of the face, and makes it appear darker; also that the roseate hue of the healthy cheek always comes out darker than it appears to the naked eye.

By the same rule, too, blue eyes are difficult to take unless well screened from the direct light, so that they may get less exposure. On the contrary, dark eyes, or those well sunk into the orbits, require plenty of light. Very few people's noses are quite straight, therefore find which way the nose is bent—if to the right, the sitter should look to the left, and *vice versâ*. If the sitter has a long nose, a portrait nearly full face will be better than a profile; if it is *retroussé*, or "turned up," get the camera higher than the sitter's head and tilt it downwards slightly; or the same effect may be obtained, as regards the nose only, by the sitter leaning his head slightly downwards. It is not every one's fortune to have a "rose-bud" of a mouth, but as it is a most expressive part of the face, endeavour to so form the lips that they will have the expression desired. Above all things, avoid a meaningless smile.

In taking views, endeavour to have the principal object in the middle distance, and remember that a prettier picture is oftener formed by placing the camera at an angle of view instead of square to the front. Practice thoroughly with one stop and lens first, and when you have mastered the working details of this, do so with the other stops in succession. In developing extra raipd or sensitive plates, have an extra loose piece of ruby glass to place in front of that in the lamp, and remove as development proceeds. With the cheap plates in the market, don't be afraid of using too much pyro—in most of the formulæ given, double the quantity may be used with safety, and this without the resulting prints being harsh or chalky. When choosing mounts, select those which will harmonise with the colour of your prints—many otherwise good prints lose much of their beauty by the inharmonious contrast in the colour of the mounts.

Finally, endeavour to give your pictures the impress of character—even as the works of the great painters bear upon the face of them the evidences of the master hand that has wrought them. Be not satisfied with mediocre work, but let your motto be "Excelsior," and I am sure then you will never regret having been fascinated with photography.

Correspondence.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Dear Sir,—May I trespass on your kindness to insert this notice. The Committee are desirous of extending the knowledge of the existence and objects of the Association, and to further that aim have issued the enclosed as a handbill. I shall be pleased to forward a supply to any photographer, photographic dealer, or others willing to assist in the circulation of the same, who will, by this action, render material assistance in obtaining the requisite publicity. With the subscription only 2s. 6d. per annum, every assistant should become a member of the Association.—Yours truly, H. Harland.

"Founded 1873. The Photographers' Benevolent Association.

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* Continued from p. 300.

(Registered under the Friendly Society's Act.) President: J. Traill Taylor, Esq. Photographic Assistants and all interested in photography are invited to join. Subscription to become eligible for benefit, 2s. 6d. per annum. Instituted to assist, by immediate pecuniary aid, deserving members, their wives and children, when in distress, through sickness, death, and want of employment, to grant annual pensions to aged members, and to aid the unemployed in obtaining situations. Full particulars can be obtained from the Secretary, H. Harland, 83, Hawksley Road, Stoke Newington, N."

Proceedings of Societies.

London and Provincial Photographic Association.

This Society held its usual weekly meeting on Thursday, the 12th inst.; Alexander Mackie presided.

At the Chairman's request, J. T. Taylor favoured the members with a brief description of the Newcastle Industrial Exhibition now open, and the names of those adjudged to receive medals for their photographic productions. In alluding to certain of the pictures he said they possessed considerable merit, and the collection as a whole was a very good one. Details will be found on page 290 of the previous issue.

Further examples of tolerably vigorous images on old platinotype paper were brought under notice by F. W. Cox, who used a 20 per cent. cold solution of washing soda as the developer. He also showed similar paper that had been developed with potassic oxalate solutions, hot and cold, without restrainers.

A. L. Henderson exhibited an improved separator, constructed to utilise centrifugal action in bromide emulsion cleansing. The internal peculiarity was not shown, but it was stated to be similar to the machine recently shown by that gentleman. Multiplying gear was now added which obviated the necessity for a band. The speed mentioned was 3,600 revolutions per minute.

The covering power and definition of lenses then became the subject of a general conversation, arising out of a question regarding "depth of focus."

Photographers' Benevolent Association.

A special general meeting was held on 5th inst., to consider the proposed alteration of following rules :—

Rule 4.—Donors of one guinea and upwards shall be entitled to vote at general and special meetings, also at the election of pensioners, and shall further have the privilege of recommending for the consideration of the committee cases of non-members, such as are defined as urgent in rule 13.

Rule 15 was altered to give the committee power to act in such cases. Urgent cases are such as arise from death, sudden illness, fire, or other unavoidable calamities; also when applicant has been out of employment for a length of time, and requires aid to take a situation.

W. Bedford, in moving the resolution, said he thought this was a step in the right direction. Donors would doubtless prefer that cases coming under their notice should be dealt with by an organized society, and would increase their interest in the Association; this would in no way interfere with the rights of members, but would give donors an opportunity of seeing that good work was being performed with their contributions to the funds. The committee would still exercise its right to judge of each case upon its merits.

A. Mackie seconded the proposition, which, after some discussion, was carried unanimously.

A committee meeting was then held, when W. F. Benham, F. H. Carter, T. Sebastian Davis, and T. Newman were elected members.

Derby Photographic Society.

The members of this Society held their first out-door excursion of the season on Saturday, May 7th, when they assembled to the number of sixteen outside the General Post Office at 1·30 p.m., and were conveyed by break to Dale Abbey, the route taken being (by the kind permission of Sir Henry Wilmot and W. Drury-Lowe,) through Chaddesden and Locko Parks. The weather was fine till just before reaching the Abbey, when it suddenly changed and commenced to rain. However, the party decided to make the best of it, and accordingly a large number of plates were exposed on the Church and Guest House, the Hermitage, and the east window of the Abbey, which is about the only portion remaining intact of this once fine old structure. At about five o'clock the sky cleared again, and the sun shining brightly caused those who had exposed their plates to wish they had waited. However, those of the more fortunate ones who had still some left, made good use of the weather. At 5.30 the party adjourned to the Guest House, where tea had been provided, and after a group had been taken they returned to Derby. At the church R. Keene read an interesting description of the place (see page 314), for which he was accorded a hearty vote of thanks.

Edinburgh Photographic Society.

The seventh ordinary meeting of the current session was held in the Professional Hall, George Street, on May 4th, the President in the chair.

James Crighton read a paper entitled "A Plea for Outdoor Meetings" (see page 311), which was well received, and the general wish expressed was for a revival of the practice which had been followed with success and greater frequency a few years ago, when small parties during the summer months were organised to proceed for a day's "outing" to some selected spot, where, camera in hand, they plied their craft to the mutual pleasure of all who took part in these excursions.

Hugh Brebner resumed the consideration of a subject he had engaged the attention of the members with on a former occasion, and concluded his remarks upon "Beauty in Pose, Proportion, and Feature." He illustrated his subject with a number of sketches in black and white.

The question, "What is a good test for stability in silver prints?" was then gone into, and a variety of opinions expressed as to the causes of fading.

Mr. Brebner suggested that one of the most constant causes of decay was sulphur in the atmosphere, and he thought prints might be experimentally exposed to certain foul or special air influences in order to test their effects upon chloride prints. He remarked that sulphide of silver is a comparatively stable compound, and yet fading came easily enough. The whole subject of fading was not well understood.

Mr. Forgan said damp was one of the greatest destroyers of silver prints.

Mr. Bibbs thought the professional showcase was about the most severe test photographs could be subjected to.

A. Wyllie had found prints well protected under glass to last much longer than copies left without such protection.

J. Gibb could recommend enamelling with plain collodion as a very good means of preservation.

A view meter was exhibited by A. A. Inglis, which was examined with some interest. It was a small portable instrument capable of being carried in the vest pocket. The view was reflected on a small mirror placed at an angle of 45°, and seen through a hole in the side of the meter.

J. Jamieson sent an example of tone in a gelatino-bromide print. A portion of the print had been separated and toned, and in this manner the effect was readily appreciated when the parts were reunited. The means by which the toning was effected was to partially bleach the print in chlorine water, then wash and expose to strong daylight until the chloride of silver is reduced to a warm tint.

Leicester and Leicestershire Photographic Society.

At a meeting on the 11th instant, with Mr. Underwood in the chair, after transaction of routine business,

Mr. Tucker proceeded to read a paper on "Lantern Slides and Transparencies by Reduction." He divided his paper into three sections—viz., apparatus, plates, and development. With regard to apparatus, he illustrated on the blackboard the arrangement of his dark-room, and the *modus operandi* by which his slides were produced, and by which he obtained lantern slides from whole-plate negatives. The mode of development preferred was the sulphite and carbonate of soda, with bromide of potass as restrainer, of which he used sufficient to cause the development to proceed slowly, giving a long exposure and protracted development, and with a No. 2 Ross lens, with $f/16$—the largest stop of the R.P.S. lens—giving an exposure (according to negative) from 90 seconds to $2\frac{1}{2}$ minutes, development occupying from five to twenty minutes.

Manchester Amateur Photographic Society.

The monthly meeting was held at the Masonic Hall, Cooper Street, on May 10th, Vice-President W. S. Stanley in the chair.

The following ladies and gentlemen were elected members:—Mrs. A. Flower, Mrs. F. Furuivel, Mrs. J. Jones, Miss L. Furnivel, Messrs. W. J. Bowden, H. E. Bythell, C. A. Davies, H. Duncan, E. Hinmers, W. B. Kenyon, C. R. Lindsay, J. H. Taylor, J. Taylor, W. H. Tetlow, and Peter Woods.

A list of rambles for the season, arranged by the Council, was brought before the members, and the arrangements made by the leaders for this month's rambles announced. The list of places is as follows:—Worsley, Speke Hall, Miller's Dale, Lysom, York, Chester, Alderley, Shrewsbury, Healey Dell, Dove Dale, Rostherne, Middlewood, Haddon Hall, Biddulph Grange, Ingleton, Hardcastle Crags, and Dunham Park.

The Secretary read a short paper on "The Society's Rambles," mentioning the usefulness of these rambles as a source of photographic experience, and asking each and every member to study the list of rambles, and to try to make the rambles successful by personal attendance.

The Librarian announced further gifts of books to the Library.

At the conversazione held after the meeting, Dr. F. Flower, W. Greenwood, and J. R. Rose exhibited photos. of the triumphal arches erected during the royal visit, and instantaneous photos. of the royal party.

J. H. Rigby exhibited a series of enlargements on Eastman paper (23 by 17), enlarged from full-plate negatives.

The Secretary exhibited miscellaneous views, and

W. Berry showed four prints from the one negative, each print being by a separate process—viz., one silver print, one carbon print, one on Obernetter's chloride paper, and one on Eastman's bromide paper.

On Saturday the first out-door ramble of the Society took place, under the guidance of G. H. B. Wheeler, to Worsley. Arriving at Worsley Station by 2 p.m., the party proceeded to Drywood Hall, where the party were admitted into the grounds. Drywood Hall, a fine sample of the Magpie style, is remarkable for its fine overhanging porch. A good view of the front of the Hall is easily taken from the lawn or tennis ground, and here the cameras, to the number of thirty-five, were soon at work. From here the party proceeded to the Warke Dam and Aviary in the grounds of the Earl of Elsmere; and the members were allowed to use the private walks and drives. From the Dam the party went through the village of Worsley, where several views of the court-house, &c., were taken. The day was fine. About fifty members and friends joined in the ramble; thirty-five cameras were used, and 194 plates and films exposed.

Photographic Society of Ireland.

The last meeting of the session was held on the 13th inst., in the Royal College of Science, Dublin, J. V. Robinson in the chair.

Louis Meldon exhibited and explained a new form of washing trough for prints or plates, as used in the observatory at Stonyhurst. The trough was divided into two compartments, and worked on a horizontal axis, so that the supply tap was either over one or other of them. When one compartment was full, the apparatus was so balanced that it tipped over, allowing the compartment just filled to empty, and placing the other one under the tap to be filled, and when the latter became full, the same thing occurred, so that the compartments went on emptying and filling alternately.

A sum of money was voted by the Society for the expenses of the Triennial Photographic Exhibition, which is to be held in the rooms of the Royal Hibernian Academy during the month of November next, and which, from the greater interest taken in photography, and the increased number of workers during the last three years, should surpass its predecessor both in the number and quality of its exhibits.

Birkenhead Photographic Association.

The ordinary meeting was held in the Free Public Library on the 12th instant, J. A. Forrest in the chair.

Thomas Comber, J. P., W. W. Rowley, Stewart Downs, and George Latimer, were elected members.

Thornton's new patent camera was explained by the inventor. A tripod and shutter were also exhibited, the latter a modification of the Kershaw, but capable of giving time as well as exceedingly rapid exposures.

Pumphrey's card-mounted flexible glass films were exhibited in their various stages of the process, and the *modus operandi* of working explained by G. A. Carruthers. A number of various-sized negatives and prints therefrom were pronounced fully equal to work done on ordinary plates, being free from granularity, and in weight almost as light as paper.

Paul Lange showed an interesting series of platinotype views illustrating boat drill on board one of the Cunard Atlantic mail steamers whilst lying in the Mersey. This drill takes place on each vessel the day previous to sailing, and only lasts five minutes, but during that time twelve excellent negatives were secured, paper and roller slide being of course used. Mr. Lange stated that he had made arrangements for a steamer which would be placed at the service of the members of the Liverpool and Birkenhead Societies at an early date for a day's cruise on the Mersey. The trip will be free to all who wish to participate, but each person going must come provided with camera and plates. June 18 was suggested as a likely day, that being the occasion of the Royal Mersey Yacht Club Regatta.

The President informed the members that an invitation had been received from Alderman Samuelson, of Liverpool, inviting them to his residence at Trefriw. It was felt that advantage should be taken of this kind offer by a visit there during an early holiday.

An excursion to Chester on the 7th instant was productive of some fine pictures, principally about the old abbey and on the Dee, Mr. Lange doing good work with his detective camera, and producing many charming and quaint street views.

F. N. Eaton exhibited a half-plate camera of his own construction and design, with all the latest improvements, which, for an amateur, was an excellent piece of cabinet work.

Talk in the Studio.

Photographic Society of Great Britain.—The usual monthly technical meeting will take place on Tuesday next, May 24th, at 8 p.m., at the Gallery, 5a, Pall Mall East, when a demonstration will be given of "Platinotype Printing."

North London Photographic Society.—There will be an excursion on Saturday, May 21st, to Waltham. The train leaves Liverpool Street (G.E.R.) at 2.43 p.m.

Melbourne Centennial Exhibition, 1888.—The offices of the Commission in England will be at 8, Victoria Chambers, Westminster, adjoining the offices of the Agent-General for the Colony, and all communications should be addressed to the Secretary at that address. No charge will be made for space. The detailed prospectus and forms of application can be obtained on personal or written inquiry at the above address. Applications for space should be returned to the London offices on or before the 31st of August; but it is requested that, in view of the distance at which the Exhibition is held, and the time necessarily involved in correspondence respecting the arrangements for the perfect accommodation of all exhibitors, the applications may be sent in at as early a date as possible.

Alleged Photograph Swindle at Newcastle.—On Saturday, at a special Borough Police-court, at Newcastle, Messrs. W. Mellard and J. Griffith being the magistrates on the Bench, William Davis, *alias* Broomfield, *alias* Emmett, was brought up under a warrant, and charged with having obtained 5s. by false pretences from Henry Denyer.—Only sufficient evidence was taken to justify a remand and presentation of the charge complete. From this it appears that prisoner called at the High School a short time since, and asked the prosecutor, who is butler there, to be allowed to take photographic views of the school. He then apparently proceeded with his work, and subsequently asked permission to occupy a dark room for a short time, so that he might do what was needful in further preparing the photos. Eventually orders were taken for some of the pictures, which were to be supplied when ready to the prosecutor, the gardener, and a servant maid. On a subsequent visit prisoner asked for an advance of money, stating that the photographs were not quite ready, but would be sent. He obtained 5s. As the pictures did not come, a swindle was suspected, and information given to the police, with the result that the accused was apprehended. It was represented that prisoner had been doing similar business amongst servants in various parts of the county. He was remanded.—*Staffordshire Sentinel.*

The Nature of Patent Rights.—In a recent jury trial for the infringement of a patent, Judge Carpenter, of the United States Circuit Court, Massachusetts, gave the following interesting explanations to the jury concerning patents and their nature:—He who has invented a new and improved process or machine may, if he sees fit, retain within his own breast the knowledge of the thing, or if he constructs machinery for the purpose of illustrating his invention and puts it into use, or if he carries on the process which he has invented, he may choose to carry it on secretly, and if he is able to preserve the secret from the depredations of others, he may thus retain a perpetual monopoly—a perpetual, exclusive use of the invention—and may thus, as it were, perpetually levy tribute upon the public for the use of it. The provision of the law, however, is that if he will make public the machine or the process which he has invented, if he will put down upon paper a clear, distinct, and intelligible description of it, then the government will give him the exclusive right for a definite number of years to use that improvement, the consideration for that grant being, of course, that he has made it known to the public, so that when the seventeen years shall have expired, the public will not only have the right, but they also will be able to exercise this art for their own profit and advantage.—*Scientific American.*

Prizes for Art-Workmen.—The Council of the Society of Arts have determined on the recommendation of the Committee of the Applied Art Section, to offer prizes to art-workmen under the following classes:—1. Painted glass, £25, £15, £10.* 2. Glass blowing in the Venetian style, £10, £5, £3. 3. Enamelled jewellers' work, £25, £15, £10. 4. Inlays in wood, with ivory, metal, or other material, with or without engraving, £25, £15, £10. 5. Lacquer, applied to the decoration of furniture or small objects, £25, £15, £10. 6. Decorative painting on wood, copper, or other material, applied to furniture and internal decoration, £25, £15, £10.* 7. Hand-tooled bookbinding, £25, £15, £10. 8. Repoussé and chased work in any metal, £25, £15, £10.

Meissonier is engaged on a replica of his famous picture "1807," the same which sold at the Stewart sale the other day for £13,000. According to Mr. Charles Kentz, of the New York *Evening Post*, who professes to derive his information from a recent letter of the painter's to Mr. Muybridge, the well-known American photographer, it was the discovery of certain faulty details in the original which has prompted the artist to undertake this task. A few years ago, when Mr. Muybridge first went to Paris with a collection of his instantaneous photographs of horses in motion, he called on Meissonier, who was greatly struck with the results of his labours, amounting as they do to a complete revelation of the secrets of equine locomotion. At a conversazione which he subsequently gave in honour of his American visitor, the painter owned, in the presence of several of his brother artists, that he had been entirely mistaken in his past observations of horses in motion.—*Midland Counties Herald.*

The Henry Draper Memorial.—Mrs. Draper has decided to extend the plan of the original proposal for instituting a research department at the Harvard University, and in connection with the scheme it is proposed to establish a station in the southern hemisphere, so that all the stars may be brought under study. A special photographic investigation will also be undertaken of the spectra of the banded stars, and of the ends of the spectra of the bright stars. The instruments employed are an 8-inch Voigtlander photographic lens re-ground by Alvan Clark and Sons, and Dr. Draper's 11-inch photographic lens, for which Mrs. Draper has provided a new mounting and observatory.—*Abstracted from Nature.*

Photographic Club.—The subject for discussion on May 18 will be "Photographing Interiors." Saturday outing at Winchmore Hill. Meeting at Railway Station near 2 o'clock as possible.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

D. Hill.—The first formula given in the Year-Book will answer well with the plates in question.

S. A. W.—Thank you very much. We should like to see such a highly complex combination of photographs.

W. G. Roberts.—We remember the old Ross dark back to which you refer, and if there is any novel point about your carrier, we should like to have a description.

C. W. M.—The third: your letter has been returned, marked as you request.

Geo. H. Cantle.—The publication extended over a long interval, and many of the numbers are out of print. The series will, however, be reprinted in book form.

C. E. King.—It is very good of you to send on the cutting, of which use has been made.

W. C. E. B.—It would depend on the regulations of the exhibition; but, in most cases, both you and the enlarger would be mentioned in the catalogue.

Z. J. X.—1. It is no use for you to take the article to the Patent Office, as they will give you no information as to whether it is novel or otherwise. You must read up the literature of the subject, and consult previous specifications. 2. It will give you protection for nine months, and, if you do not pay the additional fee, it will be considered that you have abandoned all claim to a patent. 3. It is quite optional whether you pay the additional £3 and complete the patent. 4. There is a small hand-book on patent law by Gridley; but this will not help you as regards the points you mention.

J. C. Napper.—According to our own experience it is best to obtain a clear and not over-dense negative with the iron developer, and to intensify this by the following method:—Wash well, immerse in mercuric chloride solution till quite white, and after a thorough washing, soak in a solution consisting of one part of liver of sulphur (crude sulphide of potassium) in twenty of water. This latter should be filtered, and the plate well rinsed after its use. For photolithography it is more important to obtain an even degree of density than absolute opacity. As regards the intensification of wet plate negatives for this kind of work, you will find useful information on pages 54 and 55 of the last edition of Abney's "Instruction."

D. W.—Dilute nitric acid will dissolve off the incrustation very rapidly; but you must be careful not to allow it to act so long as to attack the metal. During the action of the acid, brush the surface with a soft brush, and when the metal has been laid bare, rinse well with water to which a small proportion of ammonia has been added.

H. S.—1. Although we know nothing of the special prints turned out by the firm you speak of, we know that prints of that class are not to be depended upon as permanent in a reasonable sense of the term. 2 There is nothing to choose between them as regards this particular.

Seymour Wade.—It was mentioned in our issue of last week.

Photographs Registered.

E. W. Maalow (Birmingham)—Photo. of Dais at Town Hall, Birmingham, on the Queen's Visit.
R. Keene (Burton-on-Trent)—3 Photos. of Arthur Houlding.
D. Hedges (Lytham)—2 Photos. of the Wreck of the steamer "Mexico."
J. Russell & Sons (Wimbledon)—3 Photos. of Rev. E. W. Moore.
W. J. Byrne (Richmond)—3 Photos. of Sir Ughtred Kay Shuttlesworth.
James Glass (Londonderry)—3 Photos. of Justice McCarthy, M.P.; 1 Photo. of ditto and Miss McCarthy.
J. Kennerell (Wisbech)—2 Photos. of James Smart; 2 Photos. of G. See.
J. Worsnop (Rothbury)—Photo. entitled "Sir W. G. Armstrong at Home."
J. Chaffin & Sons (Taunton)—2 Photos. of Hon. A. Percy Allsopp, M.P.
H. L. Morel (Nottingham)—2 Photo Groups of Lord and Lady Randolph Churchill and others.
P. M. Law & Sons (Newcastle-on-Tyne)—Photo. of Duke of Cambridge at Tynemouth.

The Photographic News.

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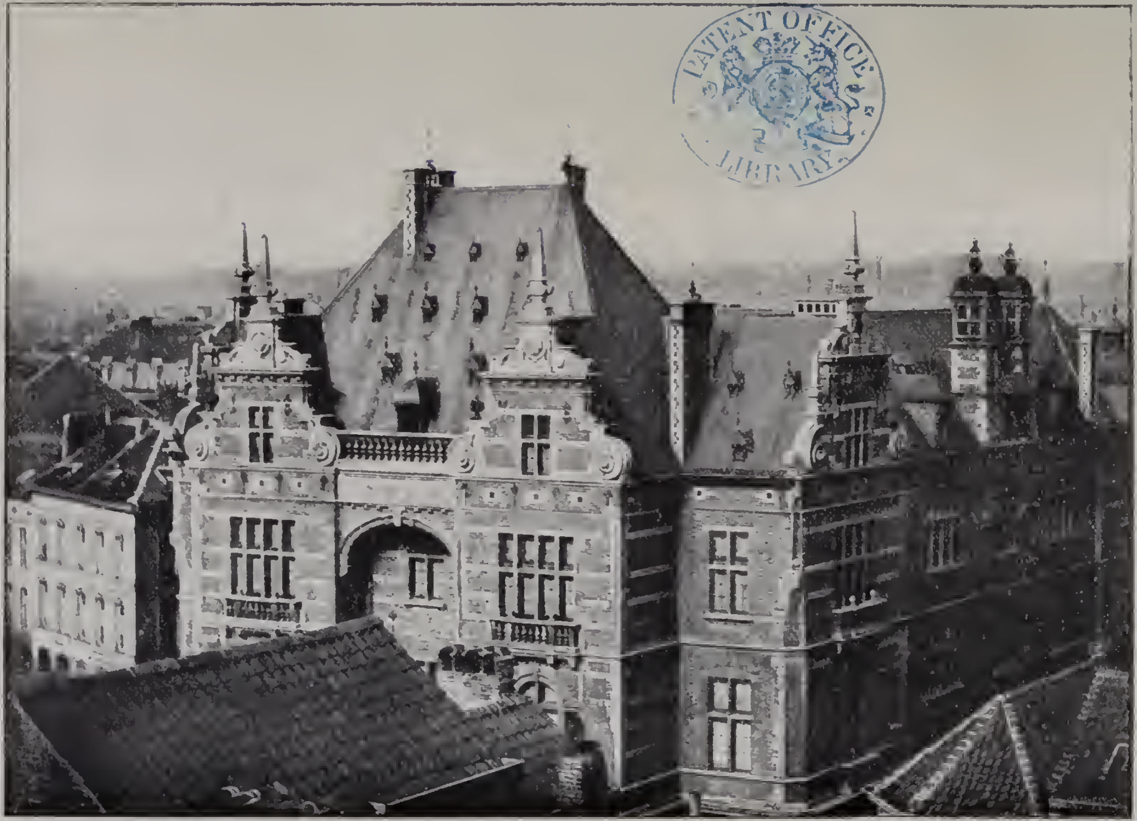
MAY 20, 1887.

SUPPLEMENT TO „THE PHOTOGRAPHIC NEWS."



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PHOTOGRAPHED BY HECTOR COLARD.

MOONLIGHT VIEW

Taken on Gelatino-bromide plate, with exposure of 75 Minutes.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1499.—May 27, 1887.

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THE CAUSE OF BLURRING—FILM STAINING AS A REMEDY, DUE TO CAREY LEA.

From Lyonel Clark we have received the following communication, and as it is so explicit, no special introduction is required.

"I read with great interest the leader in the News on film staining, and when lately using orthochromatic or stained plates, I have remarked the absolute absence of halation. In looking over the old numbers of the News I came across an interesting paper of Carey Lea's on the same subject, May 15th, 1868. He, however, uses a solution of red litmus, which by the alkaline development turns blue, and dissolves out. This appears to me interesting and useful."

Our correspondent has called attention to an important contribution to photography by the veteran experimentalist, Carey Lea, and, moreover, an article which treats the subject of halation with a thoroughness so great as to make it well worth reading nearly twenty years after it was written. This paper also puts forward what had been regarded as the latest suggestions for successfully dealing with the difficulty. In the writings of Carey Lea, Robert Hunt, and Thomas Sutton, one finds very much of that which is brought forward as new in the present day. No apology is required for reproducing the article, which appears on p. 234 of our volume for 1868.

My object in the present paper will be to endeavour to show—

1. That the precise manner in which blurring results from internal reflections has not been hitherto explained.

2. That the remedy applied (wet red blotting-paper on wet plates, painting the back of dry ones), has been a very imperfect one.

3. That in the case of dry plates, at least, a much better treatment may be employed, which principle may possibly be extended to wet plates.

Blurring is usually explained as resulting in the manner shown at Fig. 1; that is, that a ray of light, A B, falling upon the outer surface of the sensitized plate, is refracted through in the direction B C to the back at C (the thickness of the plate is exaggerated to make the action plainer). At C part is transmitted, and escapes out of the posterior surface of the glass, but part is also reflected in the direction of C D. At D it strikes the sensitive film, and, being light, not belonging to the part of the image D, it causes the appearance known as blurring.

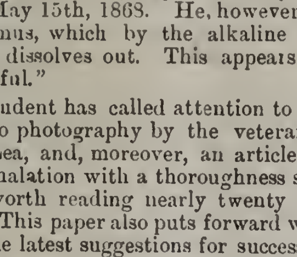

Fig. 1.

This explanation may be regarded as a first approximation to the truth, but it fails to explain much that appears on the sensitized plate.

If it were the true explanation, then a blur could only extend a very small distance from the portion of the film where the light entered, because no very oblique rays fall on the part of the camera image that is used in photography, and the unequal obliquity of these is greatly lessened by the refraction which takes place when the ray enters the glass. Consequently, the distance B D, to which the blurring spreads, would always be small, and could scarcely, at most, exceed a distance equal to the thickness of the glass; and even so wide a blur as this could only happen (if at all) at the extreme corners of the plate. Now we know that blurring may extend easily a quarter of an inch, as when, for instance, a large, dark bough of a tree in the foreground stands against the light, cloudy sky.

Again, if the usual explanation represented in Fig. 1 were the true one, blurring could only take place in the direction of a line from the centre of the image to the bright point; for the rays of light that form the image constitute a cone, of which the centre is the centre of the image. These can only be reflected by the second surface in a direction away from the centre. Now we know very well that blurring is an actual fact, controlled by no such law as this, and that it may take place in any direction. Consequently, it follows that the received explanation cannot be the true one.

The cause of this error has lain in neglecting to take into consideration the partial opacity of the film. When light strikes a translucent surface—such as a piece of tissue-paper, for example—it does not pass through in straight rays, but every point in the paper becomes, as it were, a new source of light from whence light is radiated in every direction. When, for example, an engraver places a frame of tissue-paper between him and his light, the rays no longer reach him directly, but broken in every direction. So, where tissue-paper is used for vignetting, no sharp shadows are formed by the light that passes through the paper. As already said, the paper becomes virtually a new source of light. Precisely so with the translucent film of bromide, or mixed bromide and iodide of silver. The rays that strike any and every point B in such a film do not all follow the line B C, as if there had been no film on the glass, but are radiated also in every direction B C′, B C′, &c. (Fig. 2). Striking the back of the plate, they are in part transmitted, but also in part reflected, according to the ordinary law of reflections, in the directions C′ D′, C′ D′, &c. It follows, therefore, that the reflected light may be returned to a distance from the point at which it entered much greater than the thickness of the glass, and also that it may come out in any direction whatever around the point B at which it entered, and not in one direction only, as required by the older, faulty explanation represented at Fig. 1. These two results are precisely in harmony with observed facts, for, when a disposition exists to blur, it will show itself in any direction whatever. It becomes only visible when the existence of a deep shadow renders evident the increased action caused by the displaced light; but it is an undoubted fact that the light may spread inwards and laterally as well as outwards, which it could not do if the old explanation were the true one, nor could it possibly entend so far as it is constantly observed to do.

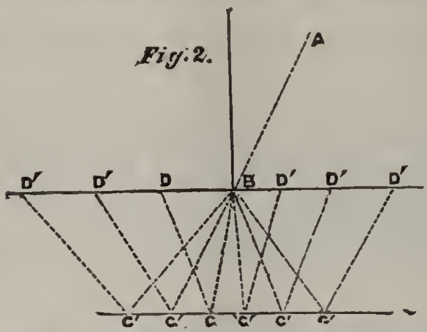
Fig. 2.

2. My next object will be to show that, although the remedy usually recommended is beneficial, it is necessarily very imperfect in its action.

To cause the rays which pass through the film to pass also through the back of the glass, totally and without reflection, it would be necessary that some substance should be applied to the back which should have the same index of refraction as glass, and also be in optical contact with it. A piece of wet blotting-paper answers these conditions to a considerable extent, but not entirely. Water has not the same refractive power as glass, and when the water dries out of a paste, its chance of maintaining optical contact is greatly diminished, so that if a reddish or brownish mixture, for example, be applied—such as anatto or burnt umber—it will be evident that the necessary conditions are only very imperfectly fulfilled; and, although such an application may be an amelioration, it is by no means a cure. It is no matter how non-actinic the colour of the substance applied may be; unless it is in optical contact, it will have no effect in preventing internal reflections.

But the question admits of a much better solution. It was sufficiently evident that if the film itself could be coloured, then these injurious rays might never reach the glass, and so be deprived of all power of mischief. The difficulty lay in finding an appropriate means.

The first condition I fixed was that the colour must not remain in the finished negative, or else the printing qualities would be injured. This at once excluded the application of colouring agents to the collodion, as these could only be alcoholic or ethereal solutions, and the chances were greatly against finding any such that could be dissolved out again without injury to the film.

The second condition was that the colouring matter must require no treatment whatever to remove it, but must disappear of itself in the developing and fixing.

The third was that it must not require a separate application, but must be dissolved in the sensitizing bath, and so be applied without any trouble. Of course the substance must be one that should not injure the sensitiveness of the plate.

These conditions were so difficult to fulfil that it was long before I could find a substance that seemed even worth trying. I did, however, obtain one that fulfilled all these requirements perfectly. That substance is red litmus—solution of litmus reddened by an acid; and I find the use of this substance not only to effect all that I expected, but even more. So far from taking from the sensitiveness of the plates, it improves them.

The mode of application is as follows:—Hot water is poured upon litmus cakes, enough to cover them; the vessel is covered and kept in a warm place for a day. The litmus becomes in this way reduced to a paste, and yields up much more colour than in the usual way of making litmus tincture. The paste is thrown on a filter, and hot water poured on till with 3 or 4 ounces of litmus cakes, about a pint (16 ounces) has run through. If the litmus is good, this solution is extremely intense in colour. Add 4 ounces of alcohol, and the solution will keep for a long time.

To the lead bath already recommended add (to 6 ounces of bath) 3 or 4 drachms of this solution; the quantity cannot be stated exactly, as litmus varies in strength; but the bath should be blood red, and the plate, on coming out, light pink in colour. The plate is then dried in the usual way. When thrown into an alkaline developing bath, it first turns bluish, and then presently dissolves out; and in the finished negative no trace of the colour remains.

If the litmus be used in excessive quantity it may cause a slight granularity of the image. This need never happen, however, and does not when the colouring matter is kept within reasonable limits; in fact, I never saw it happen but once, and then when the experiment of a very large portion of litmus was tried.

It is evident, then, that the use of this new means involves far less trouble than painting the back, at the same time that it is far more effective. To paint the back, the annatto bath must be got into good condition for each batch of plates, and must be applied at the risk of injuring the film with the fingers. The plate cannot be supported in a rack without the risk of sticking fast to what the back rests on. Again, before developing, the colour must be carefully removed with a sponge or wet cloth; whereas, with the new method, the bottle of litmus is prepared with ease, and lasts for a long time, and the trouble for each batch of plates is that of pouring a little into the bath once for all: in fact, it is so little as not to be worth reckoning at all.

Although this method was devised expressly for the process which I have lately published, there is no doubt that it is suitable for others, perhaps for all dry processes, especially as the sensibility of the plate (at least in my own process) is enhanced by it. I have not tried it with any but the alkaline development, but there seems no reason that it should not be used with pyro and silver development, and I expect to use it for such.

◆

A NEW MAKE OF THE RAPID RECTILINEAR.

From Perken, Sons, and Rayment, of Hatton Garden, we have received a small objective of the rapid rectilinear type, this being one of a series which we understand they have put upon the market.

For a long time those opticians whose names have been associated with photographic lenses almost from the period when the light picture was a novelty, have almost had a monopoly of the production of objectives of the symmetrical or rectilinear type; but during the past few years several firms have competed by the introduction of rectilinear doublets at a lower price. We may safely say that the greater part of these are of the cheap and worthless type, and may be, perhaps, considered good enough for an amateur commencing; hence we are pleased to find upon trial that the lens sent for review by Perken and Co. is really an excellent instrument, giving as much flatness of field, and as good marginal definition, as we should expect in the case of an instrument made by an optician of the very highest reputation, and it gives marginal lines which are straight. In short, we have placed the instrument among those which we have set aside for use, and not in the larger section of lenses—a section including those which we do not use, but occasionally look at.

The lens sent has an equivalent focus of eight inches, and the glasses are a trifle over an inch in diameter, so that when used without a stop its intensity is a little greater than $\frac{f}{8}$. The stops are stamped

$$\frac{f}{8},\ \frac{f}{11},\ \frac{f}{16},\ \frac{f}{22},\ \frac{f}{32},\ \frac{f}{44},$$

and the marking is particularly clear, the indentations being filled up with a white pigment; but it would have been rather better if both sides of each stop had been marked, so that the figure might be apparent at a glance, whichever side comes up first. A very trifling embarassment or disturbing influence will often turn the scale on the side of not obtaining a picture, especially when a photographer is nervous, and worried by circumstances.

Now that photography is becoming so popular as a recreation, and the demand for lenses is increasing, it is probable that many opticians will give attention to the making of photographic objectives.

Rebiew.

The Amateur's First Hand-Book. A complete Guide and Instructor in the art of Modern Photography. By J. H. E. Ellerbeck. Fourth edition; written up to date, 1887. (*Liverpool: Cussons, 79, Bold Street; London: Hamilton and Co., 32, Paternoster Row; Manchester: John Heywood.*) Price one shilling.

This is a convenient little work, suitable for a beginner, but the author must have been sadly wandering in his mind when he called it "A complete Guide and Instructor in the art of Modern Photography," and when he wrote "written up to date, 1887." To call this a complete instructor is absurd, untruthful, misleading, and discreditable to the author and to the three publishers. "Seek after perfection, but never profess it," is advice of Malbranche which the constructors of the "complete instructor" would do well to consider.

MAJOR NOTT'S "WILD ANIMALS PHOTOGRAPHED AND DESCRIBED."

BY W. GREATHEED.

Major Nott, in his work just published by Sampson Low and Co., expresses discontent with the ordinary press representations, where the ignorance of engravers is heaped on to the artist's occasional want of observation. The book contains between thirty and forty photographic illustrations of animals indisputably accurate, although he has been obliged to have recourse to the semi-domesticated prisoners of our menageries.

To realize the absurdities of which animal portraiture in the not-distant past was capable, it is enough to see in the windows of any print shop the familiar picture of a race-course in the last century. Each and every horse will be seen fully extended in a position which no horse has ever attained either before or since. The artist seems to have given us variously coloured *replicas* of one rocking-horse. That particular absurdity is dying, and we owe this to Mr. Muybridge. But the general public may long be expected to cherish similar crudities on the pretext that artists should paint only those attitudes which unskilled vision thinks it sees. It is therefore the privilege and the duty of enlightened photographers to dissipate these ignorant conventionalisms.

The author has taken most of the illustrations with his own camera, but he has borrowed from Dixon and Son and Briggs and Son. To the latter he is indebted for "Jumbo." There also were procured the contrasted views of the Soudan camels, the first having been taken when the animals were so miserably worn as to be humpless, and the second after recovery, when they looked like camels, and not like lamas. It would, perhaps, have been well if Major Nott had drawn more extensively on the rich stores of Dixon and Son, of Albany Street. He has been anxious, however, to avoid the coarseness of hair-texture occasionally seen when the system of small direct photographs for subsequent enlargement is used. This coarseness, I suggest, is due to halation, which increases the apparent size of white hairs, while halation from the lighter surroundings diminishes the dark hairs, these effects of increase and diminution being intensified by enlargement.

In casting about for a method of reproduction, the author tried Autotype, Dallastype, Gillotype, photogravure, Stannotype, and Woodburytype. He had to reject them all, either for flatness or want of detail, or that they involved the unpleasantness of curled pages. Finally, he betook himself to I. and A. Lemercier and Co., of Paris, who employ collotype.

It is worth noting that one or two of the best hits made in the last year or two at the Royal Academy have been due to the absolute accuracy of animal gesture and expression secured by photography. Take, for instance, Barber Burton's "Once bit, twice shy," representing a terrier declining a second dose of mustard, an incident I understand to be based upon the artist's own photographic work.

Major Nott has no wish to keep all the photography to himself. He is urgent that photographers on their travels should secure records of some of the rapidly dwindling species. What would not ornithologists now give for a group of dodos, feeding, fighting, courting, or sleeping! The mimicry of insects alone is a subject for a life-time. Who would not see, if this could be made possible, the leopard or the zebra lying *perdu*, the one owing concealment to those spots he has no wish to change, and the other to his stripes? For these purposes, the collectors' dried skins, and the cement floors in Regent's Park, are not adequate, and ornithologists like Henry Seebohm, taxidermists like Lord Walsingham and Mr. Ward, comparative psychologists like Sir John Lubbock and Mr. Romanes, must all wish success to Major Nott when he extends his operations, and finds imitators in every quarter of the globe.

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.*

"Ever been at Pisa?" "Ay, sir."
—*Taming of the Shrew.*

The great towns of Italy during the middle ages formed separate republics, and were constantly at war with each other. Pisa sacked and ruined her sister republic Amalfi in 1135. The following century, Genoa ruined Pisa at the battle of Meloria, and a hundred years later Venice fought with and defeated Genoa.

Pisa, in 1063, burst the chain of the harbour of Palermo, and from the rich booty secured, she built her beautiful marble cathedral. A century later, her Baptistry and the leaning tower were being erected, and in another century the Campo Santo was built, completing a group unique and unrivalled for architectural beauty. For centuries Pisa was a strong bulwark against the infidel, and Sardinia was recovered from the Saracen through her instrumentality. The Genoese became too strong for her in 1284, and at the battle of Meloria on the Arno, below the city, captured above 9,000 prisoners, cut the ponderous chain which protected her harbour, and took it to Genoa. On leaving the Arno huge stones were thrown in to block the mouth of the river, and the commerce of Pisa received a blow from which it never recovered.

It is a matter of controversy as to whether the celebrated tower of Pisa was built in a leaning position, or whether the ground gave way afterwards. Although the campanile of the cathedral, it stands separately. It measures 178 feet in height and 50 in diameter, and the topmost storey overhangs about 13 feet.

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* Continued from page 309.

Nearly two hundred years clapsed during its crection, and the probability is that the land subsided during that time, for the top storeys have a slightly different angle from the rest, as though the builders had endeavoured to counteract the defect. It can hardly be conceived that the Pisans would purposely build a beautiful tower on the slant, especially when it was to hold bells, one of which weighed six tons.

The custodian, who stays all day in the basement, inhabits a place something like a state-room of a ship in a gale of wind. You feel all at sea on entering, and are inclined to wonder when the ship will right itself; the floor slants, and the seat slants, and as you ascend the winding staircase the ship rolls in the waves; down go the steps to one side, and in a few seconds up they go to the other. The big bell is ringing for morning scrvice, but the old tower sways not, nor is it likely to fall, unless an earthquake should come that way. Such an event would indeed be bad for Pisa. The glory of the city as a commercial centre has long departed, and she largely depends upon the thousands of visitors who flock from all parts of the world to see her far-famed mellow, beautiful, marble tower. If the ancient Pisans *intentionally* built the structure on the slant, they did a grand thing for posterity.

The staircase emerges on to the topmost stones, where there are fortunately double iron rails—one surrounding the interior circle where the bells hang, and the other the outside. There is no covered top. The view is extensive and beautiful. The city, divided by the Arno, lies below, surrounded by a wide level plane, backed up by the jagged, snow-covered Apennines.

You can step out at each storcy, and walk round among the marble pillars if you are so minded; the absence of rails causes unpleasant sensations. Being struck by the novelty of the view, I set up my camera three storeys from the ground, on the lower side of the tower. A pocket spirit-level was most useful here in placing the camera upright. It is a ticklish business to set up a tripod on slanting slippery marble close to the unguarded edge thirty feet above the ground; however, the photo was a success.

The day was unclouded, and the cool interior of the grand old cathedral a pleasant change. If you would appreciate the solemn vastness of the noble building, go not in with a company of Cook's tourists, where the inevitable comic man galls you with his flippant remarks, but sit down quietly with a congenial friend, and, if so favoured, enjoy the music of the organ and the sweet voices of the choir.

Our small instrument was soon at work, but the custodian spied it, and came up to ask the usual question about permission. Fortunately, he was easily bought, and with the words "Presto presto," left us. A photographic plate objects to be "prestoed," but with a quarter of an hour's exposure the result was all that could be wished.

It is said that the swaying of the bronze lamp in the nave first gave the idea of the pendulum to Galileo; he also made use of the leaning tower for his experiments in gravitation.

The baptistry stands apart from the cathedral; it is circular, with a high conical dome, and is surrounded by half columns below, with a gallery of detached columns above; the whole having a beautiful appearance. The pulpit and font are of richly carved marble, the former supported by pillars on the backs of lions.

A fine echo can be produced here, and when the custodian utters musical notes in thirds, an octave as from a trumpet seems to reverbrate round the dome.

This man was tip proof, and politely told us to get permission to photograph, at a certain office across the Square. On production of my passport, the hoary-headed secretary most deliberately filled up a printed form granting permission to sketch and photograph inside the Baptistry. His efforts to dry the ink made his desk look like the Desert of Sahara, and the shovel wherewith he shovelled on the sand might have graced a coal box. After this the pulpit was captured, and we made for the Campo Santo.

The custodian here, a pleasant, airy, jaunty kind of man, with the most fragrant of cigars in his mouth, gave us to understand that photography was not allowed; however, with a little mutual pantomime (on *our* part), depreciating and scornful looks at our small camera, as if to say "Surely this little thing is harmless" (on *his* part), a shrug of the shoulders in true Italian style, and a majestic wave of the fragrant weed, signifying that he washed his hands of the whole affair, we passed the ordeal. He subsequently became quite chatty, and showed interest in our proceedings, and we much enjoyed the sunny quiet of the Campo Santo. We found excellent subjects in the oft-pictured corridors, and in the central open grassy ground, where fifty-three ship-loads of sacred earth from Mount Calvary had been deposited, that the dead might repose in holy ground.

On the walls of the west corridor hang the chains of the harbour mouth, sent back by Genoa after having been kept as war trophies for many centuries. Fine frescoes and marble monuments adorn the corridors.

The river—with its bridges, views of the town, and distant mountains—furnishes good photographic subjects. A most effective photograph was made from a point just outside a gate in the city wall; looking back, the leaning tower could be nicely seen framed by the archway. A picturesque old tower, now used for military purposes, standing on the river bank, its image calmly reflected in the water, is one of the most beautiful bits of old Pisa.

Pisa measures five miles round. At night, the life of the place centres in the many comfortable cafés on the "Lung Arno," where political and social debates proceed with great pantcminic effect.

The night train from Pisa lands you in Rome about 7 a.m.

SUNLIGHT COLOURS.

BY CAPTAIN W. DE W. ABNEY.*

Now let me revert to the question why the sun is red at sunset. Those who are lovers of landscape will have often seen on some bright summer's day that the most beautiful effects are those in which the distance is almost of a match to the sky. Distant hills, which when viewed close to are green or brown, when seen some five or ten miles away appear of a delicate and delicious, almost of a cobalt, blue colour. Now, what is the cause of this change in colour? It is simply that we have a sky formed between us and the distant ranges, the mere outline of which looms through it. The shadows are softened so as almost to leave no trace, and we have what artists call an atmospheric-effect. If we go into another climate, such as Egypt or amongst the High Alps, we usually lose this effect. Distant mountains stand out crisp with black shadows, and the want of atmosphere is much felt. [Photographs showing these differences were shown.] Let us ask to what this is due. In such climates as England there is always a certain amount of moisture present in the atmosphere, and this moisture may be present as very minute particles of water—so minute, indeed, that they will not sink down in an atmosphere of normal density—or as vapour. When present as vapour the air is much more transparent, and it is a common expression to use, that when distant hills look "so close," rain may be expected shortly to follow, since the water is present in a state to precipitate in larger particles; but when present as small particles of water the hills look very distant, owing to what we may call we may call the haze between us and them. In recent weeks every one has been able to see very multiplied effects of such haze. The ends of long streets, for instance, have been scarcely visible, though the sun may have been shining, and at night the long vistas of gas lamps have shown light having an increasing redness as they became more distant. Every one admits the presence of mist on these occasions, and this mist must be merely a collection of intangible and very minute particles of suspended water. In a distant landscape we have simply the same or a smaller quantity of street-mists occupying, instead of perhaps 1000 yards, ten times that distance. Now I would ask, What effect would such a mist have upon the light of the sun which shone through it.

It is not in the bounds of present possibility to get outside our atmosphere and measure by the plan I have described to you the different illuminating values of the different rays, but this we can do:—First, we can measure these values at different altitudes of the sun, and this means measuring the effect on each ray after passing through different thicknesses of the atmosphere, either at different times of day, or at different times of the year, about the same hour. Second, by taking the instrument up to some such elevation as that to which Langley took his bolometer at Mount Whitney, and so to leave the densest part of the atmosphere below us. Now, I have adopted both these plans. For more than a year I have taken measurements of sunlight in my laboratory at South Kensington, and I have also taken the instrument up to 8,000 feet high in the Alps, and made observations *there*, and with a result which is satisfactory in that both sets of observations show that the law which holds with artificially turbid media is under ordinary circumstances obeyed by sunlight in passing through our air: which is, you will remember, that more of the red is transmitted than of the violet, the amount of each depending on the wave-length. The luminosity of the spectrum observed at the Riffel I have used as my standard luminosity, and compared all others with it. The result for four days you see in the diagram.

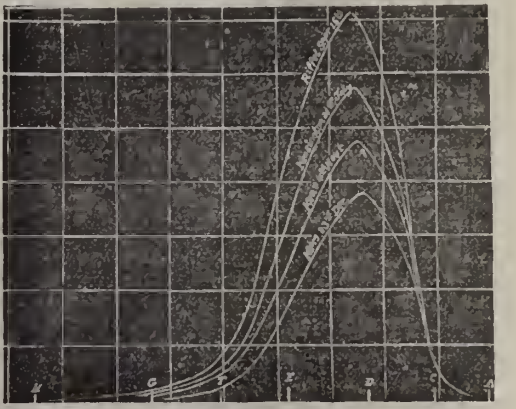

Fig. 2.—Relative Luminosities.

I have diagrammatically shown the amount of different colours which penetrated on the same days, taking the Riffel as ten. It will be seen that on December 23 we have really very little violet and less than half the green, although we have four-fifths of the red.

The next diagram before you shows the minimum loss of light which I have observed for different air thicknesses. On the top we have the calculated intensities of the different rays outside our atmosphere. Thus we have that through one atmosphere, and two, three, and four; and you will see what enormous absorption there is in the blue end at four atmospheres. The areas of these curves, which give the total luminosity of the light, are 761, 662, 577, 503, and 439; and if observed as astronomers

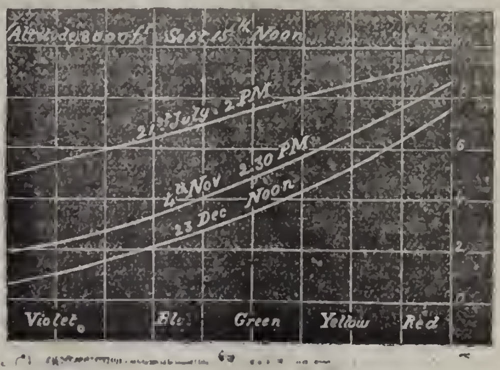

Fig. 3.—Proportions of Transmitted Colours.

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* Continued from page 296.

observe the absorption of light, by means of stellar observations, they would have had the values, 761, 664, 578, 504, and 439—a very close approximation one to the other.

Next notice in the diagram that the top of the curve gradually inclines to go to the red end of the spectrum as you get the light transmitted through more and more air, and I should like to show you that this is the case in a laboratory experiment. Taking a slide with a wide and long slot in it, a portion is occupied by a right-angled prism, one of the angles of 45° being towards the centre of the slot. By sliding this prism in front of the spectrum I can deflect outwards any portion of the spectrum I like, and by a mirror can reflect it through a second lens, forming a patch of light on the screen overlapping the patch of light formed by the undeflected rays. If the two patches be exactly equal, white light is formed. Now, by placing a rod as before in front of the patch, I have two coloured stripes in a white field, and though the background remains of the same intensity of white, the intensities of the two stripes can be altered by moving the right-angled prism through the spectrum. The two stripes are now apparently equally luminous, and I see the point of equality is where the edge of the right-angled prism is in the green. Placing a narrow cell filled with our turbid medium in front of the slit, I find that the equality is disturbed, and I have to allow more of the yellow to come into the patch formed by the blue end of the spectrum, and consequently less of it in the red end. I again establish equality. Placing a thicker cell in front, equality is again disturbed, and I have to have less yellow still in the red half, and more in the blue half. I now remove the cell, and the inequality of luminosity is still more glaring. This shows, then, that the rays of maximum luminosity must travel towards the red as the thickness of the turbid medium is increased.

The observations at 8,000 feet, here recorded, were taken on September 15 at noon, and of course in latitude 46° the sun could not be overhead, but had to traverse what would be almost exactly equivalent to the atmosphere at sea-level. It is much nearer the calculated intensity for no atmosphere intervening, than it is for one atmosphere. The explanation of this is easy. The air is denser at sea level than at 8,000 feet up, and the lower stratum is more likely to hold small water particles or dust in suspension than is the higher.

For, however small the particles may be, they will have a greater tendency to sink in a rare air than in a denser one, and less water vapour can be held per cubic foot. Looking, then, from my laboratory at South Kensington, we have to look through a proportionately larger quantity of suspended particles than we have at a hsgh altitude when the air thicknesses are the same; and consequently the absorption is proportionately greater at sea-level than at 8,000 feet high. This leads us to the fact that the real intensity of illumination of the different rays outside the atmosphere is greater than it is calculated from observations near sea-level. Prof. Langley, in this theatre, in a remarkable and interesting lecture, in which he described his journey up Mount Whitney to about 12,000 feet, told us that the sun was really blue outside our atmosphere, and at first blush the amount of extra blue which he deduced to be present in it would, he thought, make it so; but though he surmised the result from experiments made with rotating discs of coloured paper, he did not, I think, try the method of using pure colours, and consequently, I believe, slightly exaggerated the blueness which would result. I have taken Prof. Langley's calculations of the increase of intensity for the different rays, which I may say do not quite agree with mine, and I have prepared a mask which I can place in the spectrum, giving the different proportions of each ray as calculated by him, and this when placed in front of the spectrum will show you that the real colour of sunlight outside the atmosphere, as calculated by Langley, can scarcely be called bluish. Alongside I place a patch of light which is very closely the colour of sunlight on a July day at noon in England. This comparison will enable you to gauge the blueness, and you will see that it is not very blue, and, in fact, not bluer perceptibly than that we have at the Riffel, the colour of the sunlight at which place I show in a similar way. I have also prepared some screens to show you the value of sunlight after passing through five and ten atmospheres. On an ordinary clear day you will see what a yellowness there is in the colour. It seems that after a certain amount of blue is present in white light the addition of more makes but little difference in the tint. But these last patches show that the light which passes through the atmosphere when it is feebly charged with particles does not induce the red of the sun as seen through a fog. It only requires more suspended particles in any thickness to induce it.

In observations made at the Riffel, and at 14,000 feet, I have found that it is possible to see far into the ultra-violet, and to distinguish and measure lines in the sun's spectrum which can ordinarily only be seen by the aid of a fluorescent eye-piece or by means of photography. Circumstantial evidence tends to show that the burning of the skin, which always takes place in these high altitudes in sunlight, is due to the great increase in the ultra-violet rays. It may be remarked that the same kind of burning is effected by the electric arc light, which is known to be very rich in these rays.

Again, to use a homely phrase, "You cannot eat your cake and have it." You cannot have a large quantity of blue rays present in your direct sunlight, and have a luminous blue sky. The latter must always be light scattered from the former. Now, in the high Alps you have, on a clear day, a deep blue-black sky, very different, indeed, from the blue sky of Italy or of England; and as it is the sky which is the chief agent in lighting up the shadows, not only in those regions do we have dark shadows on account of no intervening—what I will call—mist, but because the sky itself is so little luminous. In an artistic point of view this is important. The warmth of an English landscape in sunlight is due to the highest lights being yellowish, and to the shadows being bluish from the skylight illuminating them. In the high Alps the high lights are colder, being bluer, and the shadows are dark, and chiefly illuminated by reflected direct sunlight. Those who have travelled abroad will know what the effect is. A painting in the Alps, at any high elevation, is rarely pleasing, although it may be true to Nature. It looks cold, and somewhat harsh and blue.

In London we are often favoured with easterly winds, and these, unpleasant in other ways, are also destructive of that portion of the sunlight which is the most chemically active on living organisms. The sunlight composition of a July day may, by the prevalence of an easterly wind, be reduced to that of a November day, as I have proved by actual measurement. In this case it is not the water particles which act as scatterers, but the carbon particles from the smoke.

Knowing, then, the cause of the change in the colour of sunlight, we can make an artificial sunset, in which we have an imitation light passing through increasing thicknesses of air largely charged with water particles. [The image of a circular diaphragm placed in front of the electric light was thrown on the screen in imitation of the sun, and a cell containing hyposulphite of soda placed in the beam. Hydrochloric was then added; as the fine particles of sulphur were formed, the disc of light assumed a yellow tint, and as the decomposition of the hyposulphite progressed, it assumed an orange and finally a deep red tint.] With this experiment I terminate my lecture, hoping that in some degree I have answered the question I propounded at the outset: why the sun is red when seen through a fog.

A PHOTOGRAPHER'S TRIP TO THE SPANISH MAIN.

BY LYONEL CLARK.*

Whilst we are steaming over the Caribbean Sea on our way to Venezuela, I will give you a short description of my photographic kit. I ought to have done this earlier; but, as a matter of fact, the slides I have shown you were all taken on my return journey. During the outward voyage my accident entirely incapacitated me from any active exertion. I had with me an 11 by 7 Hare's camera, in which I was using 10 by 7 plates. I had also a quarter-plate camera, and a couple of dozen or so of different brands of plates, for at the last minute I had to take what stock we had left in the dark room. For this small camera I had my 6-inch Dallmeyer R.R., and 4-inch Optimus W.A., both old and valued friends. For the big camera, I had one of Wray's single landscape lens, 17 inch focus working at $\frac{f}{8}$, and a most excellent lens I found it. With its full aperture, the depth of focus is most remarkable. The views of Trinidad market and the crowd on the forecastle of the *Eden* were taken with this; and you can see that both foreground and distance are sharp. Its covering power, however, is small; but it is only fair to add that it is sold as a narrow-angle lens. I much regret now that I did not get a W.A. one of the same focus and maker, as I should like to test it against a Ross I have of this focal length.

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* Continued from page 299.

I had also an old single landscape-lens of 12 inches focus—good, but slow. For instantaneous work I had one of Kershaw's blind shutters, which worked very satisfactorily. Trinidad market was taken with this; but on the whole I did not do much instantaneous work. My tripod calls for no special remark; the focussing-cloth was of thin india-rubber silk, and stood the heat perfectly, contrary to my expectation. Everything, as I said before, was got in a hurry; indeed, I had not time even to fill my double backs before starting, but had to rig up an impromptu dark room on the *Eden* for this purpose. I took a quire of non-actinic paper, and a Redding lamp, both of which I found very useful—indeed, indispensable.

Now to continue my journey. We glide along rapidly over the smooth Caribbean Sea, with a fresh north-east trade following us; we pass the double-peaked island of Margerita, and the low reef of Tortuga—not unlike the reptile from which it gets its name, for "tortuga" is Spanish for turtle—and during the night we pass the lonely Sentinel rock (a thin, steeple-like crag jutting out alone from the bed of the ocean). At five o'clock next morning I was called on deck to see a sight which I never shall forget. Right ahead of us, towering up over our heads, was a purple-blue bank of mountains, reaching from horizon to horizon—blue of that intense hue which one sometimes sees in the shadow of a great thunder-cloud, absolutely solid, cut sharp and clear against the pale emerald of the morning sky, and yet withal liquid and misty. Like a front scene in a theatre, you expected to see it rise and disclose some new transformation.

In the deep black depths of its base a few lights glimmer here and there. And now a bright gleam o'er the eastward peaks tells where the sun is laboriously heaving himself over the range, and as he rises, with his few scattered clouds attendant, the darkness of the mountain grows into life; houses, churches, castles, wooded spurs, and dark ravines gradually come out of its blackness, like the details of a negative grow under a skilful developer's hand. Everything is still; our screw is barely turning; nothing is heard save the monotonous voices of the leadsmen in the port and starboard chains, "No bottom at fifteen," and "A half fourteen," the soft tinkle of the engine-room telegraph, the hoarse note of command, "Stand by the starboard anchor," "Let go the anchor"; the cable whirrs, crash goes the gun, and as it echoes and re-echoes again in the ravines before us, the sun springs from above the peaks, and pours a flood of generous light on the town and roadstead of La Guayra.

The readers of Kingsley's "Westward Ho!" will remember this place, where Sir Amyas Leigh and his brother land to rescue Rose Salterne, and yonder fort doubtless is the very place where the then governors lived, and you can picture to yourself the whole scene—the ridge where they clambered up, and there, in yonder white line of breaking surf, is where they cut their way through to their boat, and in the scrimmage Eustace Leigh fell, and was captured. Half dreaming, you seem to see their very barge rowing off, but it is only the Venezuelan Custom-house officers, and you have to get together your traps and make preparations for landing—no easy job, with the sea that runs in on the flat shore at the foot of the cliffs. However, we had no difficulty, though on a subsequent occasion I got a wet jacket; and it is a common thing for ships to have to wait two or three days for communication with the land. Letters to the President removed all Customs difficulties, and we were soon in the train on our way to Carácas—a truly marvellous ride. Carácas is only a couple of miles in a straight line from La Guayra, but between them is La Silla, 8,000 ft. high, whilst Carácas itself lies at an altitude of 4,000 ft., and the line itself is 22½ long, with a grade of 1 in 27, and curves of 110 ft. radius. The brave little tank-engine puffs and snorts, and runs us up the steep slope, through the fringe of palm-trees on the shore, climbing up the side of a ravine, twisting out of it again, over viaducts and through tunnels; past the Boqueron, which I show you, a precipice where you can toss a biscuit from the train sheer 3,000 ft. down. The line crawls round it, wedged in between the clefts, turning in and out with such rapidity that your head turns; women are frequently sea-sick. A magnificent sight, this precipice, especially when seen, as I saw it once by the courtesy of the manager, from the foot-plate of a descending engine. This is but one of the engineering difficulties surmounted. The line follows up the side of the valley, precipice above and precipices below, taking advantage of every projection nature has left, rising steadily till, with a whistle for breaks, it passes the summit and scuds down an equally steep incline, twisting past mud huts and with a whirr and a jar pulls up at the station of St. Iago de Leon de Carácas, to give the capital of Venezuela its full name. Morley Town, with the magnificent Silla towering above it, is built on a gentle slope, the river Guayree flowing through the Vega at the bottom. The town contains many fine buildings, tram-cars, telephones, pointed boots and top hats, and other products of civilisation. I took four excellent views of it from different quarters; but alas! for the frailty of man, I took the four on two plates, so I can only show you a view of the river Guayree and the Vega, as the Spaniards call the valley on each side of the river, for the whole of Venezuela is formed of parallel ridges of mountains, with alluvial plains between, teeming with vegetation—sugar-cane, maize, coffee, and, on the slopes themselves, cacao, mangoes, bread-fruit, and anything else you like to plant; for at this altitude the climate is temperate, and even potatoes and such hardy fruits grow well—in fact, the riches of Venezuela are inexhaustible. The magnificent forests contain countless trees of untold value to our cabinet-makers; the rich mines of gold and other precious metals promise a future El Dorado for those who are wise enough to take advantage of them. Gradually the country is being opened up; those pioneers of civilisation—the engineers—are throwing their steel webs everywhere, and railways are rapidly disclosing new and rich provinces, for Venezuela is two and a half times as big as France, with a population of a little over two millions. Such a line, from Carácas to St. Lucia, now in the course of construction, I visited, and am grateful for the kindness of the staff there for a most interesting day. By train to Petaré, then on mules up the new pica or railway trace—a never-to-be-forgotten ride—climbing up or sliding down slopes like the roofs of houses, bringing up with a splash in the river. None but Venezuelan mules could take such a path—through forests, round cliffs, till we at last arrive at the advance camp up the "quebrada," as the rocky ravine is called. Here a lunch awaited us, and though I don't appear in this slide, it is, perhaps, to be accounted for by the fact that lunch was over. Still farther down the bed of the river did we go to see the Incantado. Enchanted spot! In English, a limestone cliff eaten away by the raging torrent, festooned with lianes, and covered with tropical vegetation. And the torrent goes on sweeping down the valley, tumbling over the hard or cutting through the soft formations, leaving its pile of débris in every corner to attest its vigour and strength.

My trip, however, was over here, and so I had to return to Carácas. I had no difficulty in changing places here, thanks to the kindness and courtesy of the firm of Messrs. Martinez and Salez—long may they flourish!—who placed their dark room entirely at my disposal, and, moreover, took prints of some of my negatives for me, and absolutely refused any recompense whatever. However, I was able to repay them. I had taken some groups of my very good friends, the officers of the *Eden*, and as it was, of course, impossible for me to give them all the copies they required, I left the negatives with Messrs. Martinez and Salez to print off, and charge for, as many copies as were wanted. I recommend this system to those who are desirous of rewarding the kindness of professionals. Out there, at least, groups are appreciated, and you are often able to confer great pleasure at a very small cost. I have been occasionally asked to photograph queer subjects, but never before, as befell me at Carácas, had I to photograph a tombstone. I won't show you anything so lugubrious, but in case any of you should ever think of going to Carácas, I will show you the cemetery there, in order that you may learn all the advantages of this desirable residence. It is situated in a valley parallel to the Carácas one, and the road to it is very pretty, as you see by the present slide; and though the dear deceased won't see it, yet, like the fireworks display in the "Mikado," he knows it will be there. My time in Carácas was soon up, and I had to proceed to Porto Cabello. Like La Guayra, this town is situated at the foot of the hills, though farther off, and its harbour is not open, but landlocked with coral reefs, and, though small, is one of the best natural ports I have ever seen. Here we found the *Justitia*, the famous filibustering ship, whose case appeared but shortly ago in the English papers. The crew county-courted the pirate king for wagers, or something equally Gilbertian.

She is lying there uncared for, and will soon sink and join the other motley collection of wrecks in the "Rotten Row" of Venezuela. There is a fort on the island, once formidable enough to withstand the English attacks, and I believe Cabello was the only place along the coast that the British sea-dogs did not take. However, now its walls are falling, and its cannon rusted, and it is used mainly as a prison. I couldn't get a photograph of the convicts in their cells, but whilst there some of them were assisting in lowering a flagstaff, and I got a view. They were a murderous-looking lot, of all nationalities, dressed anyhow; but they all—dire sarcasm—wore a red Phrygian cap, sign of liberty! Cabello itself is an infernal hole, and the filthy pigstye yclept hotel will remain long in my memory. But all the wealthy merchants live up the hills, about three miles out, at a place called St. Estéban—and a lovely spot they have chosen. After crossing the hot and dusty Savannah, you wind up through a pass in the hills and enter a fairy valley, through palms, and cocas, and huge plantains, and all sorts of strange plants and flowers, great masses of the scarlet-flowered madre de cacao, the air heavy with the delicious scent of the coffee. You saunter on till you arrive at last at the village, with its pretty haciendas and ranches. A stream runs babbling through it, hidden in strange vegetation, and you cannot but admire the taste of the inhabitants, who have left hot, dusty Porto Cabello for this sylvan paradise.

A line from Porto Cabello to Valencia is rapidly opening up more of this part of the country. I have again to thank the courtesy of its engineers for a trip up it. You follow the sea-coast for about seven miles, through cocoa-nut groves, then a damp plantain swamp, till you turn suddenly up the little stream, filled with huge boulders that attest the quantity of water that can come down during the rainy season. You wind up this valley through strange trees and stranger shrubs; orchids everywhere; every tree heavy with fruit or flowers, and half-staggering beneath its weight of climbers, till you get to Cambour, where the finished line ends. The coach road to Galenar passes here, following the opposite side of the barranca, with every here and there a little "pouperec," or drinking shop, for, though the Venezuelan is not a drunkard, he likes his drop of aguardiente de cannia (sugar-cane rum), or sweet sherry wine from Spain.

(*To be continued.*

Notes.

There was a rather large gathering of persons at the Technical Meeting of the Photographic Society held last Tuesday evening, these persons having doubtless been attracted by the hope of seeing a demonstration of platinotype printing. They were disappointed, as the "demonstration" turned out to be the mere development of some prints made on commercial platinotype paper.

One result of the Queen's appearance in public is, to make it clear that her published portraits are not at all like her—a point which we have enforced more than once. The *Bat* says, for instance, "People who have to depend on the pictures in the *Illustrated News* and the *Graphic*, or the unnatural productions of the photographer, are justified in asking what the Queen is really like."

Photography occupied the major portion of the time at the last meeting of the Royal Astronomical Society. Col. Tupman drew attention to a present of some very beautiful photographs of stellar spectra taken by Professor E. C. Pickering, of Harvard. As we noted some time ago, Professor Pickering has charge of the instruments provided for the Harvard Observatory by Mrs. Draper as a memorial of her husband Dr. Draper, and these instruments were employed in the production of the photographs in question, which are the first outcome of the gift. Col. Tupman observed that the photographs showed a great advance in this branch of photography, and would probably enable the motion of stars in the line of sight to be determined with much greater accuracy than has hitherto been possible.

At the same meeting Mr. Knobel read a report of the Photographic Congress recently held in Paris. The eight representatives from England were Messrs. Christie, Common, Gill (from the Cape), Knobel, Perry, Roberts, Russell (from Australia), and Tennant. The resolutions agreed to unanimously embodied a general plan of a union of astronomers in undertaking a description of the heavens by photographic means, and that the work should be carried out at selected stations and with instruments which should be identical in their essential parts. It was also resolved that the refractor was the best form of instrument, the dimensions being those of the telescope at the Paris Observatory. Directors of observatories will be free to have their object glasses made by any optician they desire to employ, provided they comply with the general conditions determined by the Congress. Finally it is proposed that the results of the photographic observations shall be compiled and published in the form of a catalogue. Mr. Common, who has always advocated the claims of the reflector over those of the refractor, stated the reasons which induced the Congress to determine upon the latter, and observed that his belief was that eventually the reflector would be found to be the best telescope, but that it would have to be improved, and that a good deal of work would have to be done before it could be sufficiently improved.

Walery, of Regent Street (Count Ostrorog), was last week summoned to Marlborough House to photograph the Princess of Wales in her Drawing Room dress, and we assume that the portrait was taken in one of the drawing rooms. Most apartments of the class called "drawing room" are sufficiently well lighted to make portraiture on a dry plate an easy matter.

Few persons who are sorely tried by numerous applications from photographers are so good natured, in the matter of giving sittings, as is the Prince of Wales, it being a very usual thing for him to give a sitting to the local photographer when he stays for a few days with a friend in the country. Moreover, there is scarce a photographic portraitist of considerable reputation in the United Kingdom who has not taken a likeness of the heir to the throne.

We once made a similar remark, and it brought us a flood of letters from and on account of photographers who were said to be exceptions to the general truth stated above. One missive ran: "Which is lik your imperdence as my son is a derstinguished phottografer in ——— Street, which you says what he is not, becas he as not phottografed the prince of whales." We comforted the good lady who wrote this, by expressing a hope that H.R.H. would visit the studio in ——— Street at an early date.

The artistic taste of the lower classes in Paris is more advanced than of similar ranks of society in London. The Paris correspondent of the *Daily News* says, "Anyone who wishes to see with his own eyes how the people appreciate art should watch them in the evenings before Goupil's windows, or those of Braun, the photographic copyist of artistic paintings. To-day I saw there women cooks, with their market baskets on their arms, stopping to look at the photographs of Millet's rustic characters and scenes; and yet they are not things which would be palatable to persons of vulgar taste." We are afraid that a London print seller would shake his head doubtfully if asked to put such photographs in his window. He has more faith in the portraits of actors and actresses, popular clergymen, and the royal family.

Great activity is now being shown in London by those who practise photo-engraving and photo-etching processes. The *Press News* recently quoted statements by various London firms which bear this out. In regard to copies of pictures, foreign reproductions would seem still to hold their own, for, although one man in London engaged in this business says he is able to compete with the foreigner in quality, he can only do so in price "sometimes." Another one says an etching that costs £25 can be reproduced in photo-engraving form for 7d., and the black-and-white reproduction presents the action in the artist's picture better than his painting. It is not quite clear what is meant to be conveyed by this last statement. If it means that a picture is more intelligible in the copy than in the original, perhaps, in cases of obscure design, it will be as well, when the latter are exhibited, to hang up photo-monochrome copies side by side.

We learn from a trade journal that the latest use to which photography has been put is to assist in the advertising of new books. The plan is to display in a prominent place a framed announcement of the just published volume, and in association with it is exhibited a large photograph of the author. Save in the case of well-known men we do not see much gain in this, but public curiosity is insatiable, and novel-reading young ladies perhaps may take more interest in a book when they know the author is good-looking. But how about the unfortunate romance writers who are plain?

The first portion of a lecture on the "Stereoscope and its Application," delivered by Professor C. F. Himes before the Franklin Institute, appears in the May issue of the journal of the Institute. Professor Himes goes thoroughly into the optical science involved in the instrument, and remarks upon a point which we have advanced as being partly the reason why the stereoscope has fallen into disuse, namely, the want of some means of adjustment of the lenses to the variable distance between the eyes of different individuals, and at the same time to the slight variation in the distance of similar points in stereographs. Professor Himes says that, although this addition would be comparatively inexpensive, there seems to be so little popular demand for anything beyond the simplest and cheapest forms, that they are not kept in the market, and one recently devised by Professor Le Conte Stevens, having this adjustment, cannot be obtained from the firm which largely advertised it in 1882. It is certainly remarkable that the interest in the stereoscope cannot be revived, especially as stereoscopic views are well within the scope of amateurs.

Patent Intelligence.

Applications for Letters Patent.

7372. Charles Klic and Louis Collardon, 46, Lincoln's Inn Fields, London, W.C., for "Improvements in the manufacture or production of blocks or plates for printing from."—20th May, 1887.

7374. Charles Klic, 46, Lincoln's Inn Fields, London, W.C., for "Improvements in the manufacture or production of blocks or plates for printing from."—20th May, 1887.

7390. Alexander Schanschieff, Gipsy Hill, Surrey, for "Improvements in magic lanterns and apparatus connected therewith."—20th May, 1887.

7464. Thomas Prescott, Arcade Chambers, St. Mary's Gate, Manchester, for "A phantom photographic camera which dispenses with the necessity of using a base board for the support of the front board and other parts of the camera."—23rd May, 1887.

Official Abstract of Accepted Complete Specifications.

Brown, 9460, 1886. "Sensitized plates, films, &c." Sensitive film on paper covered with gelatine; after development, paper is stripped off by sticking film on glass.

Specifications Published.

8329. Arthur Samuel Newman, of 87, Evershot Road, Finsbury Park, in the County of Middlesex, Electrician, for "Improvements in changing-boxes for photographic cameras."—Dated 24th June, 1887.

A changing box, topped with a bag of light-tight cloth, and something like the apparatus of J D. Neck, but with a mechanical arrangement for lifting the front plate so that it may be grasped. We will give a sectional drawing next week.

8010. George Caldwell, 187, West Princes Street, Glasgow, in the County of Lanark, Cabinet Maker, for "An improved changing box or apparatus for storing, carrying, exposing, and changing actinically sensitive films on glass, on paper, or on other material to be employed in obtaining photographic impressions in the camera."—Dated 16th June, 1886.

This invention relates to improvements in apparatus for storing, carrying, exposing, and changing actinically sensitive films on glass, paper, or other suitable material employed in obtaining photographic impressions in the camera. This apparatus consists of box containing any desired number of plate or film frames or holders, which are kept in position protecting the film from light by a protector or moveable partition, and an arrangement of springs within the box, which frames are interchangeable and removeable at pleasure for use in the camera by means of a shutter which is detached, but which forms in combination with the plate, or film frames, or holders, a complete dark slide, protecting the sensitive film from light when withdrawn from the box, thus affording the usual facilities for exposure in the camera. This shutter is provided with a spring catch or lock to securely attach it to the plate or film frames or holders. These frames or holders are faced with velvet plush or other suitable material, and are constructed to hold plates or films of any size smaller than their normal size, and are fitted with an eye or socket or other contrivance to receive the catch or lock of the shutter, and with interior catches to maintain the sensitive plate or film in position. The various parts of the apparatus may be constructed of wood, metal, vulcanite, or other suitable material or combinations of materials.

And in order that my invention may be easily understood and readily carried into practice, I will proceed to describe the same with reference to the accompanying drawings. Fig 1 shows an exterior front view of the box A, in which the plates are packed; fig. 2 shows exterior side view of the box; and fig. 3, sectional side elevation (on line 1, 1, fig. 1) showing how plate holders B are arranged inside the box A. Fig. 4 is front elevation, and fig. 5 sectional side elevation of the shutter or dark slide C. Fig. 6 is front elevation, and fig. 7 sectional side elevation of plate, or film frame, or holder B. Fig. 8, sectional side elevation of shutter C, with holder B therein or thereon.

Fig. 9, section of the shutter C (on line *a a* fig. 4), and fig. 10, section of the holder B (on line *a a* fig. 6), fig. 9 being made so as to fit over and encircle or enclose the edges of fig. 10, as will be readily seen. Figs. 11 and 12 respectively show sectional side elevation and plan of back part of a camera with the slit or aperture for receiving the dark slide and holder, fig. 8.

The sensitive plate or other sensitive surface is placed in the holder B, see figs. 6 and 7, and is retained behind the pins or projections *b* and under the loose flap B¹, which flap B¹ and edges all round (*i.e.*, between the lines *b*¹ *b*¹) are faced with velvet plush or other suitable material for making a light tight joint, and such holders are then placed in the receiving box A, all facing one way, viz., either to the right, or to the left, as in fig 3, in which twelve such holders are arranged; but the box may be larger or smaller as may be most convenient, so as to hold a greater or less quantity; but in order to ensure the perfect working of the apparatus the full number of holders, B, which the box is made to hold must always be placed therein, when preparing for use, so as to ensure all the holders being pressed tightly together by the springs *x* and *y*, there being a thin sheet of metal, or other material, W, inserted between the last plate and the spring *x*, which acts as a protector or moveable partition.

Fig. 1

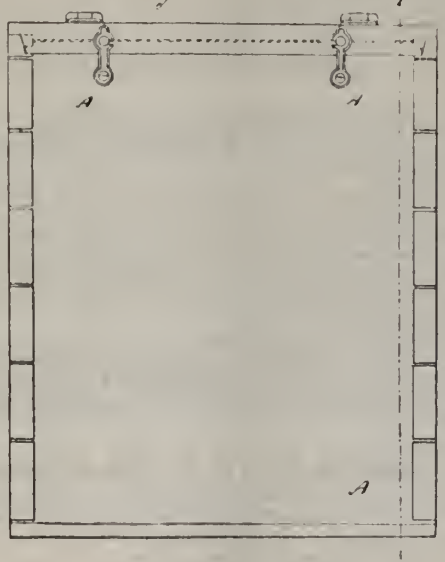
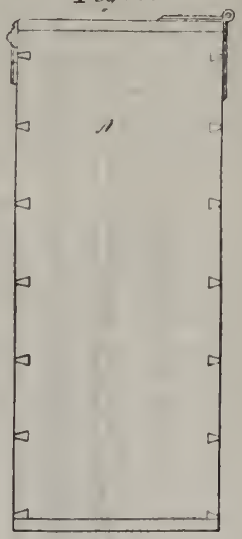


Fig. 2



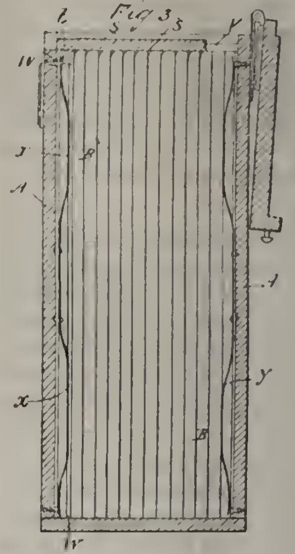


Fig. 4.

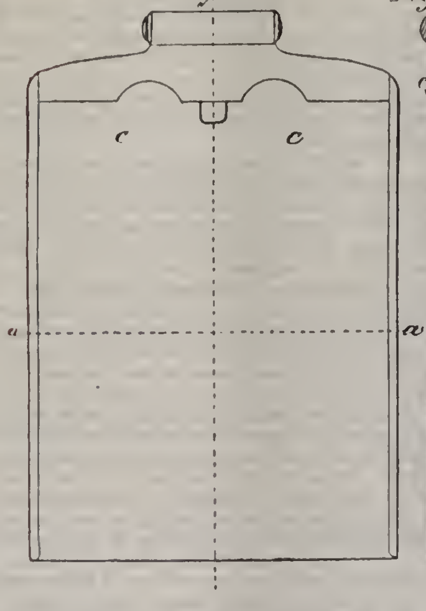


Fig 5.

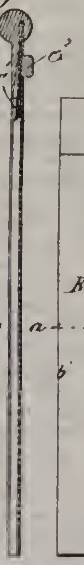


Fig. 6.

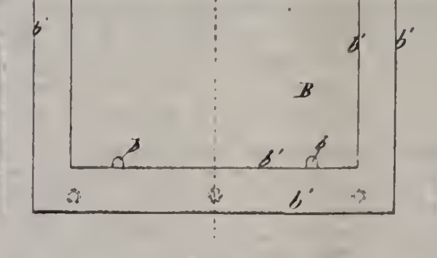


Fig 7.

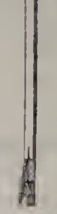


Fig. 8.

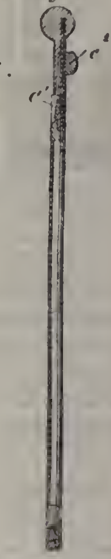


Fig 9.

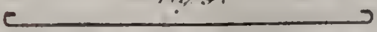
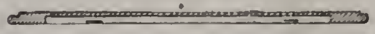


Fig 10.



The operation is as follows:—The shutter or carrier C is inserted in the opening V (figure 3), and is pressed down between the first two holders B in the box A. (*i.e.*, between the face of the outer plate, or film frame or holder B), and the back of the contiguous one, the turned over edges of the shutter C encircling or enclosing the edges of the outer holder, and is pressed righ to the bottom of the box, the spring catch or lock C^1 on the shutter C engages or catches in the hole or recess B^2 on the holder B, securely attaching the holder and shutter together, see (figure 8), which may now be withdrawn from the box A, the sensitive surface being perfectly hidden from all light. The focussing frame in the camera is then pressed back by means of *f* (figures 11 and 12) sufficiently to allow this shutter combined with the holder (figure 8) to be passed into the camera in front of the focusing register or frame *g*, the dark back of the shutter being towards the lens, and the dark back of the holder being against the focussing frame, the spring *f* of which, with the focussing register, or frame *g*, is forced back as the slide (figure 8) is inserted until in proper position, when the spring catch *f* engages, and retains the holder B, which holder is kept in position by the springs *h* in the back of the focussing frame. The shutter C is then withdrawn by pressing knob C^2 (figures 5 and 8), which releases C^1 from catch at B^2, and the sensitive surface is thus left in exact position occupied by the focussing register *g*, and ready for exposure in the ordinary way. After exposure the shutter C is again pressed in over this holder to remove it from the camera, the catch C^1 retaining the holder B, which is now relased from spring catch *f*, and the two together, B and C as in figure 8, withdrawn from the camera, and transferred to the storage or receiving box A (figure 3), where it is inserted (by pushing the sliding lid *s* across over the opening Y) in the opening *t*, and pressed between spring *x* and the protector or moveable partition W, with the holder now turned facing the unused plates, so that when the shutter C is released from the holder B, and withdrawn, the sensitive surface is towards the protector or moveable partition W, and the velvet or other facing makes a light-tight joint. The operation may be repeated until all the plates or films have been exposed or used up—which is shown by the position of the protector or moveable partition W, which will then have travelled across the width of the box—the operator being careful to always withdraw each holder from the opening *v* and re-insert it at *t*, or vice versa if the plates are arranged the other way about.

Fig. 11.

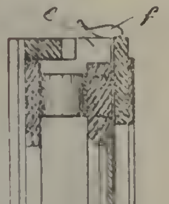
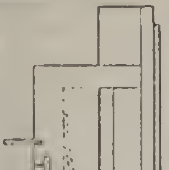


Fig. 12



PATENT OFFICE LIBRARY

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to performed, I declare that what I claim is :—

1. The improved shutter or carrier C arranged to act substantially in the manner and for the purposes hereinbefore described and represented in figs. 4, 5, 8, and 9 of the drawings hereto annexed.

2. The sensitive plate or film holder or frame B, constructed and arranged substantially in the manner and for the purposes hereinbefore described and represented in figs. 6, 7, 8, and 10 of the drawings hereto annexed.

3. The improved arrangement and construction of the box A, with springs *x* and *y*, and movable partition or division plate W for holding or storing the sensitive plate or film holders B, substantially in the manner and for the purposes hereinbefore set forth and represented in fig. 3 of the drawings hereto annexed.

4. The spring catch on the camera for holding and retaining the plate or film holder while withdrawing the shutter C, substantially as hereinbefore described and represented in the drawings hereto annexed.

5. The use and application of the shutter C in combination with the sensitive plate or film frame or holder B, together forming a complete dark slide which can be employed in any light for transferring the sensitive film or plate in the holder B from the box or reservoir A to the camera, and return same to the box A, substantially in the manner and for the purposes hereinbefore described.

6. The combination of the several parts of the apparatus for storing, carrying, exposing, and changing the sensitive plates or films employed in obtaining photographic impressions in the camera, substantially as and for the purposes hereinbefore described.

3139. Alfred Julius Boult, of 323, High Holborn, in the County of Middlesex, M.I.M.E., for "Improvements in photography and photographic reproduction." (Communicated from abroad by *Albert Sichel*, of New York, United States of America, Merchant.)—Dated 1st March, 1887.

This invention relates to photography and photographic reproduction.

The object is to produce photographs in a new and efficient manner; the object is also, in a novel, expeditious, and effective manner, to produce upon a hard surface, such as that of glass, porcelain, metal, a lithographic stone, or the like, a representation, view, picture, image, or ornament, so that the surface will itself present a representation, view, picture, image, or ornament, or that impressions of such can be taken therefrom by known printing methods.

The invention consists in the employment, for the purposes of photography, of resinates, especially those not readily soluble in water, such as the resinates of certain metals and organic bases; the invention also consists in preparing glass, porcelain, metals, lithographic stones, or other appropriate surfaces, for production or reproduction, by the application thereto of a solution of a resinate, suitably strengthened, which, after drying, after having portions of it exposed to light, and after being treated with a substance or with substances that will attack the portions which have been exposed to light, or will affect them without attacking or affecting the portions which have not been exposed to light, or with attack or action upon these in a less degree, or after being treated with a substance or with substances which will affect, attack, or remove the portions which have not been exposed to light, without affecting, attacking, or removing the portions which have been exposed to light, or with influence upon these in less degree, will present a representation, view, picture, image or ornament, or a printing surface thereof; the invention also consists in an object having its surfaces so prepared.

My correspondent finds that the resinates of metals and organic bases, by exposure to light, change their properties as to solubility, and to resistance to bleaching and oxidising agents and acids, different resinates differing in degree of such change.

Before exposure to light, the resinates not readily soluble in water are soluble in benzole and various other hydro-carbons, in ether, chloroform, and bisulphide of carbon, and are almost indifferent to the action of bleaching agents such as hypo-chlorite or sodium; but, after exposure to light, my correspondent finds that they become more or less insoluble in the above named solvents, and are affected by these bleaching agents. He has particularly employed the resinates of alumina, zinc, magnesia, silver, and of quinine. The resinates may be employed uncoloured, or they may be coloured as by a colour in solution, such as an aniline colour or by a pigment, finely divided, such as ultra marine, or by both. For the purposes of this invention he prefers to use the resinate of magnesia, and this coloured with an aniline colour.

As an illustration of how to carry out this invention, I will give the following example:—I first prepare the resinate of magnesia, and, by preference, in the following manner—I take a neutral resin-soap-solution, add to the same carefully a solution of a salt of magnesia, such as the sulphate or chloride, and wash and dry the resulting precipitate—resinate of magnesia. I produce this precipitate coloured, either by adding a solution of the desired colour to the resin soap solution or to the magnesia salt solution before precipitation, or by passing an aqueous or alcoholic solution of the colour through the dry precipitate. I then, after drying, dissolve the resinate in benzole, ether, chloroform, bisulphide of carbon, or other suitable solvent. I then coat the surface upon which I wish to produce the photograph with the solution, and then expose it to the action of light in the usual manner; that is, either in a photographic camera, or under the picture, drawing, or other matter which I wish to reproduce, if this be upon a transparent or translucent material.

When I wish to produce the negative of an object I subject the prepared surface, after suitable exposure to the action of benzole, ether, bisulphide of carbon, chloroform, or similar solvent which will affect or remove those parts which have not been exposed to the action of light, without materially affecting the parts which have been so exposed. When I wish to produce the positive of an object, I subject the prepared surface, after suitable exposure to light, to the action of hypo-chloride of sodium, oxidising agents, alkalies, or acids which will affect those parts or the colour on those parts of the surface which have been exposed to the light, without materially affecting the parts or the colour of the parts which have not been exposed to light. Photographs can be so produced upon any surface which is not liable to injury by the action of the above-named chemicals.

My correspondent has found that the photographs can be made more durable by the addition of a caoutchouc, gutta-percha, or india-rubber solution, or the solution in benzole, &c., of other suitable bodies, to the solution of the coloured resinate, before the same is applied to the surface on which the photograph is to be produced. My correspondent has also found that the different colours differ in degree in their resistance to light, and therefore if he uses a resinate coloured with a mixture of two or more colours of different powers of resistance, the photograph obtained will show different colours and shades. My correspondent has also found that he can use, in place of the salts of the acid or acids contained in resin—that is to say, in place of the pure or simple resinate, the salts of the chlorine, bromine, or iodine—substitution products of such acids, intending hereby to claim the use, for instance, of salts of bi-bromo-, or bi-iodo-abietic acid, instead of the pure acid of the resins.

When a surface suitable for etching, coated by a resinate dissolved in benzole, bisulphide of carbon, &c., to which has been added a solution of gutta-percha, caoutchouc, rubber, or gums, &c., has been exposed in parts to light my correspondent has found that either the portions which have not been exposed to light, or those which have been exposed to light, may be etched without materially affecting the others. My correspondent finds when, with the addition of caoutchouc, or the like, he applies the method above described for producing a negative, that the parts which have not been exposed to light will be more affected by etching agents than those which have been so exposed; and when, with similar addition, he applies the method above described to produce a positive, the parts which have been exposed to light will be more sensitive to the action of etching agents than those which have not been so exposed.

To prepare a suitable surface on glass, porcelain, or other similar substance, the methods which I prefer to employ are as follows:—By one method a benzole solution of a suitable resinate—by preference the resinate of magnesia—is made, add to it a solution of gutta-percha or rubber, then coat the surface of the substance employed with the mixture, expose it in parts to light, as desired, then subject it to the action of hypo-chlorite of sodium, which affects or removes the resinate where exposed to light, and then to the action of hydro-fluoric acid, which thus more readily etches the parts which have been exposed to light than the others. I can also etch on glass, porcelain, or the like, by following the method just described, omitting the use of hypo-chlorite of sodium; but the former procedure is preferable, as by the latter the etching may not be so perfect.

By another method, the surface is coated and exposed as above, then subjected to the action of any solvent of the resinate and rubber, such as a mixture of benzine and benzole, which affects or removes the portion of the coat which has not been exposed to light, and then to the action of the acid, which thus more readily etches those parts which have not been exposed to light than the others.

Of course other surfaces, such as metals, lithographic stones, &c., can be etched in the same manner by using the appropriate acids.

The solution which my correspondent has found best adapted for coating the surfaces is as follows:—1 per cent. of caoutchouc, 15 per cent. of resinate of magnesia, 84 per cent. of benzole.

In some instances he may prepare a printing surface without etching. To do this my correspondent finds the following method preferable: He applies the coating of resinate and caoutchouc or the like, and expose to light as already described, and then subject the surface to the action of a solvent, by preference a mixture of benzole and benzine. The photograph obtained may then be reproduced upon the application of fatty inks. Of course all the surfaces so produced, be they in intaglio or in relief, are susceptible of reproduction for multiplication by galvano-plastic or other well-known processes.

Having now particularly described and ascertained the nature of the said invention, as communicated to me by my foreign correspondent, and in what manner the same is to be performed, I declare that what I claim is—

1. The new process of photography, which consists in coating a suitable surface, upon which it is desired to produce a photograph, with a solution of a resinate of a metal or of an organic base, subjecting the prepared surface then to the action of light, as described, and then to the action of a suitable agent to obtain a negative or a positive of an object, as desired, substantially as set forth.

2. In the art of photography, the employment of a resinate as the essential sensitizing medium, substantially as and for the purpose set forth.

3. As a new article of manufacture, a resinate photograph, substantially as described.

4. The process of preparing a hard surface in suitable condition to be etched, or for use to yield an impression without being etched, which consists in coating the surface with a solution of a suitable resinate strengthened by caoutchouc or the like, subjecting it in parts then to the action of light, and then to the action of an agent which will affect some parts of the coating more than others, substantially as described.

5. The new process of etching, which consists in coating an appropriate surface with a suitable resinate strengthened by caoutchouc, or the like, subjecting it then, in parts, to the action of light, then to the action of an agent which will affect some of the coating more than others, and then to the action of an etching substance, substantially as described.

6. The new process of etching, which consists in coating an appropriate surface with a suitable resinate strengthened by caoutchouc or the like, subjecting it in parts to the action of light, and then directly to the action of an etching substance, substantially as described.

7. A reproducing surface composed of a suitable resinate and caoutchouc, or the like, substantially as set forth.

Patents Granted in America.

361,388. Simon Wing, Boston, Mass. "Plate-holder for photographic cameras."—Filed November 29, 1886. Serial No. 220,158. (No model.)

Claim.—1. In a photographic-plate holder, the dark-shell herein described, consisting of a sheet-metal box having an open end and formed with corrugations or crimps extended entirely about it near the open end thereof, substantially as described, and for the purpose specified.

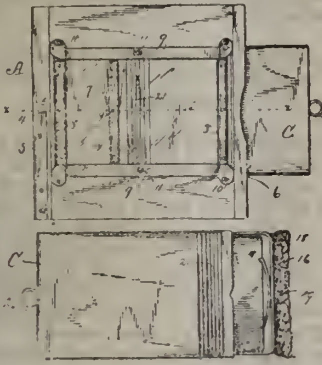
2. In a photographic-plate holder, the dark-shell herein described, consisting of a sheet metal box having an open end and flared side edges, and provided with corrugations extended entirely about it near the open end thereof, substantially as described, and for the pupose specified.

3. The photographic-plate holder consisting of an outside shell or sheath consisting of an integral sheet-metal box having an open end, and a plate-receptacle adapted to fit within and be held by said box, and provided with a plug covered with a

yielding material to set within and close the end of the shell, substantially as described.

4. The photographic-plate holder consisting of an outside shell or sheath having an open end and formed with corrugations extended about it, and a plate-receptacle formed to slide within the shell and formed with an end plug covered with yielding material to set within and close the open end of the shell substantially as described.

5. The sensitized-plate carrier consisting of a shallow pan with a flange on its end provided with a covering having a yielding surface, substantially as described.



6. The sensitized plate receiver consisting of a shallow pan with turned up and out edges, and provided with a flange on its end covered with a textile material having a villous finish, substantially as described.

7. The sensitized plate receiver consisting of a dish-shaped plate provided with an end flange covered with a yielding material and having a central spring, a plate-keeper secured on the end flange of the plate-holder, and a holding-spring with projecting ends secured in the other end of the holder, substantially as described, and for the purpose stated.

8. The combination of the dark-shell consisting of a sheet-metal box having an open end, and formed with corrugations or crimps extended entirely about it near the open end, with the sensitized plate pan formed with a broad end flange covered with a material having a yielding surface, and provided with a hole to engage a catch in the camera, substantially as described, and for the purpose stated.

9. The combination with a camera frame provided with a latch, of a sensitized plate pan formed with a flange at its outer end, provided with a yielding covering, and an aperture to take the latch on the camera, and a dark-shell consisting of a sheet-metal box with an open end, and formed with corrugations or crimps extended entirely about it near its open end, and a finger-piece secured to the closed end on the dark-shell, all substantially as described, and for the purpose stated.

362,271. Robert D. Gray and Henry E. Stammers, New York, N.Y., "Photographic camera." Filed October 5th, 1886. Serial No. 215,371. (No model.)

Claim.—1. In a photographic camera, the combination with a camera-lens uncorrected for spherical abberation, of a curved paper support for holding the sensitive paper in the focus of the lens, substantially as specified.

2. In a photographic camera, the combination with the sliding camera tube, of a rock-shaft journaled in the camera-box, provided with arms engaging the camera tube and having an index lever and a scale provided with a notched flange for engagement with the said index lever, substantially as specified.

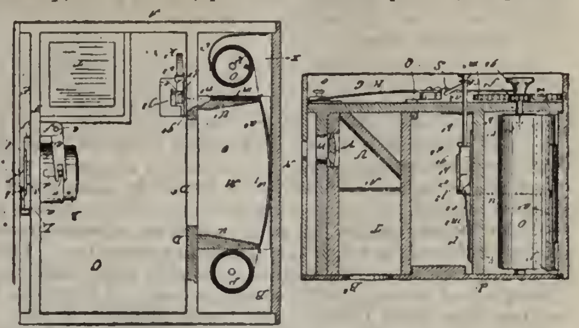
3. In a photographic camera, the combination with the curved paper guide and support, of a roller adapted to carry a supply of sensitive paper, and a roller adapted to receive the sensitive paper after exposure, substantially as specified.

4. The combination with the paper guide and support w, of the spring a', arranged to press the paper at opposite ends of the exposed portion thereof, substantially as specified.

5. In a photographic camera, the combination with the paper-holding roller, of a spirally grooved wheel and indicating mechanism connected therewith, substantially as described.

6. In a photographic camera, the combination with the paper-holding roller, of the spirally-grooved wheel m', the lever R, provided with the point t', and the scale v', substantially as specified.

7. In a photographic camera, the combination with the paper-receiving roller, of the spirally grooved wheel m', provided with holes q', the lever R, provided with the point t', adapted to slide in the spiral groove of the said wheel and fitted to the holes q', and means for disengaging the point t' from the holes q', substantially as specified.



8. In a photographic camera, the combination with the paper guide and support, of the needle m^2, and the supporting-spring l^2, the sliding bolt d^2, provided with the bevelled end e^2, and oblique shoulder k^2, the finger j^2, and the spring i^2, substantially as specified.

9. The combination with the lever R, and bolt-operating rod b^2, of the rock-shaft S, arranged to be operated by the said rod b^2, substantially as specified.

10. In a photographic camera, the combination with the apertured shutter K, provided with the lugs $k\,l\,m$, of the lever L, provided with the arm q, and the double-acting spring n', adapted to return the lever to a central position, substantially as specified.

11. In a photographic camera, the combination with the main shutter K, provided with the aperture j, of the auxiliary shutter t, adapted to slide by gravity, so as to cover or uncover the aperture of the main shutter, as herein specified.

* * *

CITY AND GUILDS OF LONDON INSTITUTE FOR THE ADVANCEMENT OF TECHNICAL EDUCATION.

The Technological Examinations held under the auspices of the above institution are now of annual occurrence. Towards the end of May in each year an evening is set apart by the executive, when pupils or others wishing to be examined on a technical subject are enabled to do so by making an application before the middle of April. Examining centres have been established in the majority of large towns, and in London there are, at least, half-a-dozen. The conditions are, in nearly all respects, similar to those laid down by the Science and Art Department, South Kensington. There are, however, only two grades, ordinary or pass, and honours; certificates (first and second class) being awarded in each grade.

Prizes.—The following are granted by the Institute:—Honours grade—First prize, £5 and a silver medal; second prize, £2 and a bronze medal. Ordinary grade—First prize, £3 and a silver medal; second prize, £3 and a bronze medal; third prize, £2 and a bronze medal; fourth prize, £1 and a bronze medal; fifth prize, a bronze medal.

At the examination which took place on Wednesday evening, the 25th inst., the following questions were given to the photographic section by the examiner.

Three hours was allowed for working the paper, the result of which will be made known early in August next.

Instructions.

The Candidate must confine himself to one grade only, the Ordinary or Honours, and must state at the top of his paper of answers which grade he has selected. He must *not* answer questions in more than one grade.

If he has already passed in this subject, in the first class of the Ordinary Grade, he must select his questions from those of the Honours Grade.

The number of the question must be placed before the answer in the worked paper.

Ordinary Grade.

(*Not more than eight questions to be answered*).

1. Give reasons why the swing-back of a camera should be vertical when taking photographs of architectural subjects. Illustrate your answer by diagrams.

2. What chemical changes take place in fixing a print on ordinary albumenized paper?

3. What is halation? How is it caused? How can its evil be mitigated?

4. Describe the method of giving an albumen substratum to a plate which has to be used in the wet precess. What special precautions are necessary when collodion dry plates are to be manufactured where this substratum is employed?

5. There is always a certain amount of silver to be obtained from the films of spoilt gelatine plates. How should such residues be collected, and how treated to obtain metallic silver from them?

6. Give your method of developing a plate which has been exposed on a subject in which there are very strong contrasts of light and shade. Your endeavour should be to produce a harmonious picture devoid of harshness. Explain your reasons for adopting the method you suggest.

7. Prints are brought to you to mount and finish. Describe how you should proceed, giving fully the various appliances you would use. You should state your reasons for adopting any particular material that you may use in the operations.

8. What kind of artificial light should you use in developing a gelatine negative when this operation has to be performed at night? How would you proceed to test the suitability of such a light?

9. In copying maps or plans by the wet collodion process: 1st. What strength of silver bath? 2nd. What developer? 3rd. What intensifier should you employ?

10. I have a residue of silver bromide which, when dry, weighs 752 grains. How much metallic silver ought I to obtain from it, and how much silver nitrate?

(Ag. = 108. N = 14. O = 16. Br. = 80).

11. Using a lens of 12-inch focus, with a stop $\frac{1}{4}$-in. in diameter, I have to give an exposure of thirty seconds. Had a lens of 10-inch focus been used, with a stop $\frac{3}{8}$-inch in diameter, what exposure would have been necessary?

Honours.

(*Not more than eight questions to be answered.*)

1. A tracing of an architectural subject is brought to be copied by means of photography to the exact size of the original. The prints are to have a white ground like the original. What process should you use? Describe in detail the whole procedure you would adopt.

2. How can a block to be printed with type be made from a photograph in half tone?

3. A (coloured) picture has to be reproduced by photogravure, and the photo-engraver requires a negative which will give a print which will represent it best. Describe in detail the method you would adopt to produce such a negative, giving reasons for every operation.

4. I have an intimate mixture of bromide and chloride of silver. Give some method of ascertaining chemically how much of each there is present.

5. In the Daguerreotype process the mode of development is different to that used in the modern negative process. Describe it, and give your idea of the cause which makes this mode of development to be effective.

6. Compare the advantages and disadvantages of a phosphorescent tablet for use in the sensitometer with those of a gas flame. Enter as fully as you can into the theoretical reasons.

7. Describe a simple form of apparatus for use in photographing spectra, illustrate your answer by a sketch, and explain the various parts of such apparatus.

8. The optical qualities of a single achromatic lens have to be discussed, and the lens is taken out of its mount. How should you proceed to separate the two or more component lenses, and how would you ascertain the curvatures of such lenses?

9. Explain the origin of the flare spot in lenses, and show how the evil has been mitigated.

10. Compare a print developed on gelatino-bromide of silver, with a platinotype print:—1st, As to ease of production; 2nd, Colour; 3rd, Permanency.

Correspondence.

PATENTS AND PATENT SUITS.

Dear Sir,—The information at present at my disposal relating to the recent suit brought by the Eastman Dry Plate and Film Company against Messrs. E. and H. T. Anthony and Company, of New York, is not so complete as to warrant me in fully answering the communication of the Messrs. Anthony which you published in the last number of the Photographic News, but from the information thus far furnished me I have every reason to believe that many of the statements in the article referred to are in no sense, in accordance with the facts. The action was brought by the Eastman Company to compel the Messrs. Anthony to discontinue the use of special machinery for the manufacture of bromide paper, and the defendants could not, and did not, make any vigorous defence. The judge ruled that if Messrs. Anthony would stipulate in writing that they would not use the machine, or one substantially like it, or allow it to pass from their possession, he would dissolve the restraining order. To this Messrs. Anthony objected, but upon the judge intimating that he would continue the stay, they weakened, and signed the stipulation. Now if the machine was in no way an infringement upon our patent, why did the defendants make any objection to signing the stipulation.

The result accomplished all that we brought suit for, but the position of "no defence" taken by the defendants prevented us from introducing evidence bearing upon the manner in which the defendants obtained information relating to our machinery and process.

If the defendants feel aggrieved under the charge of "fraud and conspiracy," it is to be hoped that they will seek redress in the usual manner, when we have no doubt some interesting evidence will be forthcoming.

The strangest part of this controversy is the action brought by the Messrs. Anthony against the Eastman Company for infringement of a patent granted to one T. C. Roche, May 3rd, 1881, for what is now known as bromide paper, and the process for making the same. The patentee has always shown remarkable facility for patenting old and well-known inventions, and the Messrs. Anthony, his employers, a singular weakness for these, as they are called in America, "scare patents."

Anyone at all familiar with the history of photography will remember the patent of Joseph Wilson Swan, sealed January 20th, 1880, and dated July 22nd, 1879. The specification of this patent certainly sets forth with all clearness details of the manufacture of bromide paper in a manner intelligible to anyone versed in the art, and was *published* January 20th, 1880, more than four months prior to the date of Roche's patent, or, to be more exact, eighteen clear days previous to Roche's application.

In the *British Journal of Photography* of May 14th, 1880, Mr. W. T. Morgan, then of the firm of Messrs. W. T. Morgan and Co., of Helio House, Circus, Greenwich, S.E., and now member of the firm of Morgan and Kidd, of Richmond, S.W., advertised a pamphlet on gelatino-argentic bromide paper as then in press, and on July 30th, 1880, they again advertised that the pamphlet "is now ready."

This pamphlet was written by John Burgess, and was published to facilitate the introduction of the then commercial bromide paper, which Mr. Morgan informs me he had made fully nine years previous, and bad shipped in response to orders *from the United States*—thus proving that the existence of the paper as an article of commerce was then known in America long before Roche's application.

Nor is this all, for by turning to the *British Journal Almanac* of 1874, page 53, the advertisement of our old friend Peter Maudsley appears, offering the goods as a commercial article, and in the same edition, page 129, Maudsley enlarges upon the method of manipulating this paper.

It would seem useless to cite further references in a matter so well understood, at least upon this side of the Atlantic, even after the warning which the Messrs. Anthony have seen fit to inflict upon the American photographers that they will hold them responsible for damage if any paper but Anthony's is used.

That Mr. Roche should patent and persist in claiming exclusive rights to an old and well known process is not surprising, but that so old and reputable a firm as Messrs. E. and H. T. Anthony and Co. can be ignorant of the facts as above stated is passing strange, and we very much doubt that the American photographer will camly consent to be gagged in that way.—Yours truly,

13, *Soho Square, London, W.* William H. Walker.

Proceedings of Societies.

Photographic Society of Great Britain.

A meeting of this Society was held in the Gallery, 5a, Pall Mall East, on Tuesday evening, the 24th inst., W. **England** in the chair.

T. **Samuels** exhibited his improved detective camera, the subject of a recent patent. It takes the form of a long rectangular box of ebonised wood, but may be covered with paper, leather, &c., and at one end are a dozen plates ranged in metal sheaths. When the front plate has received an exposure, it is partially lifted by a catch. The hand is then inserted in a twill sleeve, and the plate removed to the back, thus causing the next one to face the lens. Distances ranging from three to twenty feet may be focussed with a lever bar situated outside the camera and guaged to an index scale. Several prints were shown to illustrate the practicability of the instruments. In each case no special focussing was done, nor a tripod used.

T. S. **Davies** advocated the adoption of a reflector in the interior, which would possess the double advantage of showing a non-inverted image on a small ground glass screen, and become a view meter as well.

Several present related their experiences with small cameras used without a tripod. The advantages attending a fixed focus were also discoursed upon, and Dallmeyer's instructions for estimating the focus of distances referred to.

F. W. **Edwards** then demonstrated the process of developing a batch of large prints on platinotype paper, which occupied the remainder of the evening.

A numerous collection of finished prints were exhibited upon the tables, and a few examples of the process printed on cambric were shown by the Chairman.

London and Provincial Photographic Association.

A meeting of this Society was held on the 19th inst., H. M. **Smith** in the chair.

The **Hon. Secretary** (J. J. Briginshaw) made a few remarks upon the value of paper negatives to the tourist, especially in reducing the weight of his kit. He showed some examples, and drew attention to a form of flexible film possessing a finely ground glass surface appearance.

A. L. **Henderson** spoke of prepared gelatine sold in sheets for this purpose which was quite clear.

A letter from J. B. **Spurge** was read in reference to his non-appearance at a former meeting. Important business engagements at the University College, Liverpool, and press of work at the American Exhibition, prevented his giving the promised paper on sensitometers, &c.

W. E. **Debenham** read an abstract from one of the journals ascribing certain remarks to W. K. Burton which were not very complimentary to English photographers. Neither the speaker nor any present believed Burton made use of the expressions complained of, but gave the New York reporter the credit of mistaking Burton's utterances.

H. S. **Starnes** showed a contrivance for holding 3¼ by 3¼ plates while being coated with collodion emulsion. It consisted of a piece of tin plate turned at the corners to grip the glass plate, and was held by means of a wood handle.

A question whether an advantage, or the contrary, was gained by substituting the front of a Darlot portrait series and combining it with the back of the landscape type for views, was discussed.

The **Chairman** had tried mixing lenses in this way, but failed to discover any appreciable difference.

T. F. Saunderson was elected a member.

Out-door meeting on Monday, the 30th inst., at Chiddingstone. Train from London Bridge to Penhurst station at 9.35.

North London Photographic Society.

At the meeting on the 17th instant at Myddelton Hall, J. **Traill Taylor** in the chair, C. Cusworth, J. G. Hilton, and E. Purton were elected members.

C. **Coppin** exhibited and explained the working of his patent "one back," which was examined with interest.

C. **Cusworth** showed a half-plate camera of his own construction.

A. **Mackie** exhibited some transparencies on plates coated with the collodion emulsion he had made at the lecture at the previous meeting.

W. H. **Walker** (of the Eastman Company) delivered a lecture explanatory of the principles and working of the Eastman-Walker stripping film. In course of this he described a discovery that had been made by which the expansion of paper when wet was in a large measure obviated. He also described the various operations incident to the manufacture of the films. He was ably aided by J. **Jackson**, who very skilfully demonstrated the process, from the development of a negative to the final stripping, specimens of the work at various stages being handed round.

Excursions were arranged for May 28th to Richmond (meet in Booking Office at Richmond Station 3.15 p.m.); and for May 30 to Chiddingstone (London Bridge Station, S.E.R., at 9.35 a.m.); book to Penshurst.

On June 7 a technical meeting, to which visitors are invited.

North Surrey Photographic Society.

The usual fortnightly meeting was held at the Greyhound Hotel on May the 11th, J. **Crosthwaite** in the chair.

Some extremely fine platinotype pictures by Payne Jennings were passed round and elicited great admiration, the artistic merit of these productions being of the highest standard.

After the usual business, an exhibition of lantern slides was made, several members contributing specimens of their work. G. Smith, of Great Portland Street, brought a fine selection of slides made by the Woodbury process. Some exquisite collodion transparencies kindly lent by Mr. Gale were also exhibited.

Mr. **Smith** explained the principles and working of a special camera designed by him for the production of lantern pictures.

Bury Photographic and Arts Club.

The ordinary monthly meeting was held on May 18th, in the Temperance Hall, Henry Street, President F. W. **Livsey** in the chair.

After discussion as to the places for the outdoor meetings for the ensuing year, it was decided that the Council should choose the following places—Kirkstall Abbey, Fountain's Abbey, Hardcastle Craigs, Tabley Park, Speke Hall, Lyme Hall, and Malham.

The **Secretary** (C. H. Openshaw) then produced a pneumatic drop shutter, designed by himself and H. M. Dearden, and made by S. Hepworth; also some photographs of trains, exposed by the same, which were much admired, there being not the slightest sign of movement, though the trains were going at full speed. The shutter was admired both for its simplicity and speed.

The **President** then produced a photograph (silver print) of

Nuttall Hall, which had nearly faded out. He said the photograph had been thoroughly washed, and mounted with a reliable mountant. It had also been kept in a dry place. He invited the members to discuss the cause of the fading, which resultde in the general opinion that the mount contained some impurity.

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Talk in the Studio.

WORK TENDING TOWARDS THE REALISATION OF PHOTOGRAPHY IN COLOURS.—Photography in colours has an ideal towards which photographic experimentalists have been looking ever since the birth of photography, and steps in this direction are constantly being made; the published experiments of such men as Ducros du Hauron, Vogel, Draper, Abney, Eder, Carey Lea, Oberuetter, Albert, and Löwy, serving to give us distinct hope for the ultimate realisation of the ideal. One of the latest contributions towards chromo-photography appears in the May number of the *American Journal of Science*, and is by Carey Lea. We shall commence—and, perhaps, finish—the reprinting of this article in the PHOTOGRAPHIC NEWS of next week. As regards photography in colours, dust is frequently thrown in the eyes of the public by commercialists who colour photographs, and lead the people to believe that in constructing such productions, they have done something towards the solution of the problem of photography in colours.

LEAD FOIL FOR VIGNETTING.—From Lyonel Clark we receive a note as to the convenience of using lead foil, placed outside the printing frame, as a means of vignetting. He encloses a piece of foil which weighs about five ounces to the square foot, and says:—"It is so soft that you can dish up the edges of the opening with the greatest ease, and obtain great softness. In fact, you can alter it much more easily than cotton wool. I cut the vignetter bigger then the printing frame, and then bend down the edges, so that it fits on the frame like a cover, does not shift, and always registers to the same place."

CATTLE IN A PHOTOGRAPHER'S WAITING ROOM.—At the Bow County Court, on the 20th, before W. W. Ravenhill, Esq. (Deputy Judge), Morhall *v.* Preston was heard. The plaintiff is a photographer, of 190, High Street, Stratford; the defendant a cowkeeper, of Carpenter's Road, Stratford; and the action was for £20 for damage done to the plaintiff's house, shop, furniture, and photographs, through the negligence of the defendant's drover in allowing his cattle to enter the plaintiff's premises whilst being driven along the High Street, loss of business, &c. Mr. Willis, solicitor, of Stratford, appeared for the plaintiff, and Mr. Beard for the defendant. The plaintiff stated that at half past five on the afternoon of the 15th of December, he heard an unusual noise of stamping in the passage, and his wife and children screaming. She told him that a drove of cows had gone into the waiting room. The room was 12 feet by 6 feet, and he found three cattle wedged in there; they had come in through the street door, which was open, walked along the passage, and down some steps. Presently the drover came, and said he understood the cattle had done some damage. He (plaintiff) said, "Whose cattle are they?" He replied: "Don't make a fuss; they are Mr. Preston's." He showed him the cattle, and after some difficulty they got them out the same way as they entered. The defendant himself was then at the front door, and he said to him, "Are these your cattle?" He said, "Yes; have they done any damage?" He (plaintiff) said, "Come and see," and took him in and showed him the damage. He said, "It was all through that b—— bull." meaning one of the three cattle. He (plaintiff) said he should expect him to put it right. He said, "Yes, I will put it right," and returned in a little time with a male and female servant, and began to clear the place, as he had told him he did not want to lose any time, and he took a desk and table, which were broken, away with him to have them mended. He sent a man to varnish the passage. He (plaintiff) urged him to lose no time, as the holidays were coming on. 133 photographs were broken, also the doors, floors, and furniture, and the walls were also damaged. He claimed trade loss through not being able to carry on his business, the total amount being £20. Evidence was given of the damage, and other corroborative evidence for the plaintiff. The defence was that the drover was an independent man not employed by the defendant, who was, therefore, not responsible for his acts. His Honour observed that he should hold that the defendant adopted the acts of the drover, and after hearing some evidence for the defence, adjourned the case for further evidence.

CAMERA CLUB.—On Thursday, 9th June, T. M. Brownrigg will give an exhibition of lantern slides made from negatives taken during his recent travels on the Continent. The illustrations will include landscape, interiors, and statuary. The next club excursions for members and friends are to Brastead and Westerham on Saturday, June 4th, and to Marlow and neighbouring points upon the river on Saturday, June 25th.

AMATEUR PHOTOGRAPHERS NOT WANTED AT DEAL.—The Deal photographers, imagining their profession suffers from visiting amateurs, have induced the authorities to impose a fee of 10s. 6d. for the first day, and 3s. 6d. on subsequent days to anyone who dares to tread their pier with his much loved camera. Herne Bay is wiser, and feels only too pleased to see its visitors taking views, which increases their pleasure, and lends a charm to their visit.—*The Herne Bay Press.*

THE PHOTOGRAPHIC CLUB.—The subject for discussion at the meeting on June 1st will be "Retouching and Double Printing." Bank Holiday outing at Leatherhead, leaving by the 10.43 train from Victoria, and 10.35 from London Bridge.

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To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

INQUIRER.—1. A gelatino-bromide plate, treated as recommended in the YEAR-BOOK. 2. For general work it will be slower. 3. Decidedly better for landscape work.

WALTER D. WELFORD.—We have every wish to assist you in the matter, but have nothing to do with the private business of any one of the three publishing firms you mention. It is, however, sad to contemplate that of three firms of photographic publishers, one should be "uppish," another "decidedly uncivil," and the third so very neglectful of its own interests. We must hope for a better time to come.

HENRY GEARY.—We appreciate your kindness in forwarding us the cutting, of which use has been made.

H. C. BRAUN.—Of the two, only one is in print, and we send you a cutting from it, which answers all your questions.

M. APPOLD.—An easily soluble gelatine—such as one of the cut soup gelatines sold by Nelson and Co., of Dowgate Hill—is the most suitable. 2. It should not be over-heated; as a general rule, not above 150° Fahrenheit. 3. By no means add hydrochloric acid, as it will certainly cause insolubility. 4. It is generally made by the third process.

INVESTOR.—You have erred; the affair is a swindle.

PAXTON.—Write to the secretary of the Photographic Society of Great Britain for a form.

C. M.—Your absurd question can be best answered by the conventional reply to the ancient conundrum about the number of cats' tails required to reach the moon: "One, if it is long enough."

JOHN POULTER.—We have used picric acid for the purpose, but think that naphthaline yellow (dinitro-naphtol) will answer better.

R. C.—1. Not at present. 2. Rather over-exposed. 3. Abney's "Instruction in Photography." It is published by the same firm that publishes the PHOTOGRAPHIC NEWS, and costs 3s. 6d.

W. H. B.—Occasional articles have appeared in the NEWS touching on the matter; but on all the usual tourists' routes in Switzerland there is abundance of subject matter for the camera. Unless you have had considerable experience as a mountaineer, you had better not attempt photography in such high places as those selected by the gentleman to whom you refer. We will write privately, and give you one or two routes where the inexperienced tourist may photograph at his ease, and in safety.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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ISOLATION OF THE MATERIAL COMPRISING THE LATENT IMAGE.

In Carey Lea, of Philadelphia, the United States possess a photographer of the highest scientific acquirements. Of all his work, perhaps the ferrous oxalate developer, which he published in 1877, is best known. But his researches have covered almost every branch of scientific photography, and he has made his mark in many places.

The physical theory of development, by which the action of light upon certain silver salts is supposed to consist in throwing the constituent atoms of each molecule into violent vibration, in which state the separation of the haloid from the metal is more readily effected by the developer, had Carey Lea for one of its originators; and until lately he was, perhaps, its most powerful supporter. Researches, however, in which he has been engaged for the last three years have compelled him to throw over this theory, and to adopt—not the opposite (chemical) theory, which believes that silver chloride is simply reduced to silver sub-chloride by the action of light—but a new theory altogether.

Recent work in isochromatic photography has revealed the curious way in which certain dyes adhere to silver compounds when once brought into contact with them. Although such dyes may be soluble in water, it is yet found impossible to free the silver salts from them by washing. In a similar manner alum has a remarkable power of combining with and separating organic colouring matters from their solutions, forming certain pigments called lakes.

Now Carey Lea has discovered that silver chloride ($AgCl$) can combine with silver sub-chloride (Ag_2Cl), in somewhat the same manner, to form a curious compound, to which he has given the name of photo-chloride of silver, and of which he believes the latent image to be composed.

In a very remarkable article which we, according to our promise of last week, reproduce in our columns, Carey Lea describes—not one, but many ways of preparing this substance; and the advantage of being able to prepare practically any quantity of what has hitherto been considered so mysterious a body will, for experimental work, be invaluable.

It is stated that the new photo-salts—for photo-bromide or photo-iodide of silver can be obtained as readily as photo-chloride—are (except in the presence of light) remarkably stable, being unaffected by cold strong nitric acid and other reagents. The characteristic colour of these photo-salts is red, though they are probably obtainable of "every tint existing in the spectrum." More important still, these photo-salts have the power of reproducing the colours of bodies, so that under red glass they become red, under blue glass blue, and so on. In this way naturally coloured prints of brightly painted lantern slides can easily be obtained.

The nature of the union existing between the chloride and the subchloride will be an interesting point for chemical discussion; as we have already pointed out, it is analogous to that of "lakes," and probably also to that existing between the earths of several rare metals—samarium, yttrium, &c.—in a manner which has been recently described by Crookes. In any case it must be a form of molecular combination; but the remarkable fact is, that it appears capable of existing between almost any amount of the subchloride, at least from an infinitesimally small amount up to eight or nine per cent., on the one hand, and the chloride of silver on the other.

We consider Carey Lea's paper, which follows close upon this article, as the commencement of a new era in the study of the subject to which it relates, and we look to English experimentalists to confirm and extend his results.

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ON RED AND PURPLE CHLORIDE, BROMIDE, AND IODIDE OF SILVER—ON HELIOCHROMY, AND ON THE LATENT PHOTOGRAPHIC IMAGE *

BY M. CAREY LEA, PHILADELPHIA.

Part I.

In this series of papers it will be my object to show :—

(1) That chlorine, bromine, and iodide are capable of forming compounds with silver, exhibiting varied and beautiful colouration, peach blossom, rose, purple, and black; that these compounds (except under the influence of light) possess great stability; that they may be obtained by pure chemical means, and in the entire absence of light.

(2) That of these substances the red chloride shows a tendency to the reproduction of colours. It seems not improbable that the material of the infinitesimally thin films obtained by Becquerel, Niepce de St. Victor, Poitevin, and others, in their experiments on heliochromy, may be the red chloride.

(3) That these substances, formed by purely chemical means, constitute the actual material of the latent or invisible photographic image; which material may now be obtained in the laboratory, without the aid of light, and in any desired quantity. They also form part of the visible product resulting from the action of light on the silver haloids.

For more than a generation past the nature of the latent photographic image, that which forms the basis of development, has been in dispute. Two theories have been maintained. According to the one, the first effect produced by light is simply a physical change, predisposing the elements of the silver haloid to dissociation ; so that when a reducing agent is applied, the molecules so affected yield more quickly to its influence. According to the other theory the invisible image is formed of a sub-salt (sub-chloride, &c.) Observations which I published many years ago led me strongly to the first-mentioned of these theories. But of late years results have been obtained not easily reconcilable with it. On the other hand, the theory that the latent image is formed of sub-salt is opposed to striking facts. Silver sub-chloride, for example, is an unstable substance, quickly destroyed by dilute nitric acid. But I have formed a latent image on silver chloride, and after exposing it for five minutes to the action of strong nitric acid (sp. gr. 1·36) have developed the image without difficulty; the same with silver bromide. Evidently these images, which so strongly resisted the action of undiluted acid, could not be formed of simple sub-chloride and sub-bromide of silver, substances quickly destroyed by it.

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* The American Journal of Science for May, 1887 (Third Series, vol. xxxiii., p. 349.)

In the desire to find a satisfactory explanation of the nature of the image, based on adequate chemical proof, I have devoted nearly three years of laboratory work to this and to closely allied subjects. I am led to the conclusion that neither of the older views is correct.

A truer theory seems to be deducible from the result of some experiments which I published in 1885, to the effect that the silver haloids were capable of uniting with certain other substances, much in the same way that alumina forms lakes. When a silver haloid was precipitated in the presence of certain colouring matters, they combined with it, and though soluble in water, they could not be subsequently washed out. They had formed a somewhat stable compound, although the proportion of colouring matter was very small in comparison with the haloid ; evidently much too small to represent a stoichiometrical composition.

Now I find a silver haloid may, in the same way, unite with a certain proportion of its own sub-salt, which, by this union, quite loses its characteristic instability, and forms a compound of great permanence.

Another explanation is possible. The sub-salt may combine with the normal salt, not in the manner above described, but in stoichiometrical proportion, and this compound may be diffused through ordinary silver haloid. I have not been able to find any reaction decisive between these explanations,* but the general behaviour of the substance seems rather to indicate the first-named explanation as the true one. When the red chloride, for example, has been boiled with dilute nitric acid for a few moments, to eliminate any uncombined sub-chloride, the proportion of sub-chloride left has never exceeded eight or nine per cent. in over thirty specimens analysed. If we took this to represent a compound in equivalent proportions, we should have to suppose the union of at least twenty equivalents of $AgCl$ with one of Ag_2Cl, which is improbable. If we suppose that these coloured substances, containing from less than one-half per cent. up to eight or nine per cent. of Ag_2Cl, consist of a compound of one equivalent of sub-chloride united to a small number of equivalents of normal chloride, then it would be improbable that specimens could not be obtained containing a larger proportion of this compound, and consequently of Ag_2Cl ; but, as already said, specimens containing more than 9 per cent., after thorough treatment with nitric acid to remove the uncombined sub-chloride, I have never obtained : generally the amount is less.

Even when silver chloride, bromide, or iodide contains as little as half of one per cent. of subsalt combined, its properties are greatly changed. It has a strong colouration, and its behaviour to light is altered. Even a much less quantity, one inappreciable to analysis, is capable of affecting both the colour, and the behaviour to light.

It is one of these latter forms of this substance that constitutes the actual material of the latent photographic image ; adequate proof of this will be given in the second part of this paper.

Red Silver Chloride.

Of the three haloids, the chlorine salt is the most interesting, because of its relations to heliochromy ; it is also the most stable of the three compounds, and exhibits perhaps a finer variety of colouration, though the bromide and iodide are also obtainable of very beautiful tints. The chloride shows all the warm shades from white to black through the following gradations—white, pale flesh colour, pale pink, rose colour, copper colour, red purple, dark chocolate, black.

These compounds are obtained in an endless variety of ways—by chlorizing metallic silver ; by acting on normal chloride with reducing agents ; by partly reducing silver oxide or silver carbonate by heat, and treating with HCl ; by forming sub-oxide or a sub-salt of silver, and treating with HCl followed by nitric acid ; by acting on sub-chloride with nitric acid or an alkaline hypochlorite, &c. ; by attacking almost any soluble salt of silver with ferrous, manganous, or chromous oxide, &c. ; by reducing silver citrate by hydrogen, and treating it with HCl ; by treating a soluble silver salt, or almost any silver solution, with potash or soda, and almost any reducing agent, cane-sugar, milk-sugar, glucose, dextrine, aldehyde, alcohol, &c., and supersaturating with HCl ; there is no organic easily oxidizable substance that I have tried that has failed to give this reaction. Also almost any salt of silver exposed to light, treated with HCl, and then with hot strong nitric acid, yields it. Almost any of these classes represents a long range of reactions, each susceptible of endless variation. In fact, the more the matter is studied, the more extended the range of reactions is found to be that give rise to the formation of this substance. To show how slight an influence will lead to the production of red chloride instead of white : if freshly precipitated argentic oxide is mixed for a few moments with starch or tragacanth paste, and is then treated with HCl, the result is, not white, but pink silver chloride. Even raw starch flour mixed with silver oxide will in a few moments cause it to give a pale fresh-coloured chloride with HCl. Boiled starch or tragacanth paste does this more quickly, and acts more strongly, even if cold, and still more if heat is applied.

Although red is probably the most characteristic colour of this substance, so that I have spoken of it above as red chloride, nevertheless this hardly seems a proper name for a substance that is often purple, chocolate, or black, sometimes brown or even ochrous, sometimes lavender or bluish, and is probably capable of assuming every colour of the spectrum. To call it argento-argentic chloride would infer a stoichiometrical composition that, as already mentioned, seems very uncertain, too much so to serve as the basis of the name. Therefore, and as these substances have been hitherto seen only in the impure form in which they are produced by the continued action of light on the normal salts, it might be convenient to call them photo-salts, photo-chloride, photo-bromide, and photo-iodide, instead of red or coloured chloride, &c., and thus to avoid the inexactness of applying the term red chloride to a substance exhibiting many other colours.

Photo-Chloride by Action of Alkaline Hypochlorites.

Black or purple black chloride is easily obtained by the action of an alkaline hypochlorite on finely-divided silver, such as is obtained by reduction in the wet way. Commercial sodium hypochlorite may be used to act on it. It is to be poured over the silver, and, after standing a few minutes, is to be replaced with fresh. After an hour or two this is again to be replaced with a new portion, which is to be allowed to act half an hour to insure the total conversion of the silver. The product varies somewhat in colour, is sometimes black, oftener purple-black. If the treatment with hypochlorite has been thorough, strong cold nitric acid of 1·36 sp. gr. extracts from it no silver. This reaction with nitric acid is important, as it shows that not only metallic silver was not present, but that the product contained absolutely no uncombined subchloride; for if any were present it would instantly be decomposed by the acid, in which one half of its silver would dissolve. The action, therefore, appears to take place in this way. First, sub-chloride is formed; part of this is further chlorised into normal chloride, which at once combines with other sub-chloride, thus taking it out of the further immediate action of the hypochlorite, and this goes on until an equilibrium is reached, and neither metallic silver nor uncombined sub-chloride is left, as is proved by the action of nitric acid. Alkaline hypochlorite, as will presently be shown, attacks uncombined sub-chloride very rapidly, the combined very slowly. By many days' contact the quantity of combined sub-chloride is gradually reduced.

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* Silver chloride may be dissolved out by hot solutions of sodium or ammonium chloride, but the sub-chloride is at the same time decomposed. See beyond under head of "Reactions."

Prolonged treatment with hot, strong, nitric acid destroys all the varieties of photo-chloride. The time needed varies a good deal. A specimen of that obtained with hypochlorite required twenty-five hours' heating with acid of 1·36 in a water-bath at 212° F., to bring it to the condition of white normal chloride. Considering that cold dilute nitric acid instantly destroys freshly precipitated argentous chloride in the free state, this long resistance to strong acid at the temperature of boiling water must be considered most remarkable.

When the red or photo-chloride is formed with the aid of a ferrous salt or ferrous oxide, I prefer to boil the product with dilute HCl to get rid of the last traces of iron, after a preliminary treatment with hot dilute nitric acid has removed silver and uncombined sub-chloride. The photo-chloride will sometimes even resist boiling aqua regia for a time.

Protected from light, photo-chloride is perfectly stable. Specimens obtained eighteen months ago appear to be quite unchanged.

When treated with ammonia, it is far more slowly attacked than the normal. The ammonia dissolves the normal chloride only. The union between the two must, therefore, be broken up, and this takes place slowly. The first action of the ammonia is to change the red or purple colour to greenish black, and then to slowly dissolve out silver chloride. Hours are required, even with a large excess of ammonia. Whilst this is going on, if the ammonia is poured off and replaced with nitric acid, the original colour reappears. If the action is continued sufficiently long, silver only remains, and dissolves readily in nitric acid. A little short of this treatment with nitric acid leaves a black residue of dark chloride mixed with metallic silver; the dark chloride being insoluble in any acid has led to some strange mistakes in a similar reaction which occurs in treating with ammonia silver chloride that has been exposed to the light. Even a theory has been had recourse to of a "passive condition" of silver. This passive silver is simply black chloride.

A specimen of purple black chloride was treated with warm strong aqua regia until whitened by conversion of the sub-chloride to normal.

By this treatment 2·563 grains of photo-chloride gained nine milligrams, indicating the presence of 2½ per cent. of sub-chloride, or, more exactly—

Sub-chloride	2·49.
Normal chloride	97·51.

This is not to be taken in any sense as representing a constant composition. The proportion of sub-chloride varies between certain limits, not only according to the method of preparation used, but independently of it. Another specimen of black chloride formed with hypochlorite gave figures that indicated a content of less than half of one per cent. of sub-chloride.

Photo-chloride by Reduction of Normal Chloride.

This is an excellent means of obtaining red chloride. The white chloride is to be dissolved in ammonia, and ferrous sulphate added, producing an intensely black precipitate. After standing a minute, the mixture is to be treated with dilute sulphuric acid until it shows a strong acid reaction.

The precipitate is to be first well washed by decantation, then boiled first with dilute nitric, then, after washing, with dilute hydrochloric acid, which must of course be thoroughly washed out.

The product obtained in this way is often of singular beauty. It might easily be taken for metallic copper. Sometimes it is as rich and bright in colour as the copper obtained by electric deposition. Every one knows the richness and brilliancy of that form of copper, and I have seen it fully equalled by this silver salt.

The beauty of the colour depends always on the thorough removal of any metallic silver that may be present, and still more in getting rid of every trace of iron. The boiling with dilute hydrochloric acid should be continued until, after thorough washing, a fresh treatment extracts no more, and the acid remains colourless in presence of alkaline sulphocyanide.

Instead of an ammoniacal solution of silver chloride, we may make a solution of any other silver salt in ammonia, and reduce it in the manner just described with ferrous sulphate. But in this case hydrochloric acid must be used instead of sulphuric after the reduction. This single reaction includes an almost endless variety of methods. The acid with which the silver was originally combined seems to be not without influence in the result; in some cases, for example, with arseniate and molybdate, the action of coloured light on the red chloride seems to be somewhat modified. Silver phosphate, on account of the ease withwhich it suffers reduction, is very well adapted for this treatment.

Photo-chloride by Partial Reduction of Oxide by Heat, and Treatment with HCl.

This method has the advantage of avoiding all admixture of foreign substance, the last traces of which are very hard to get rid of, and seem to exert an effect on the colour disproportionate to their quantity. Accordingly the photo-chloride obtained in this way is very beautiful; the shades are from pink to copper red, and a tint resembling burnt carmine.

Heat may be applied to the oxide in either of two ways—long continued heat at 212°F., or near it; or the change may be effected by roasting.

When slow heat is to be applied, care must be taken that the oxide does not carbonate itself, which it easily does superficially; this is an objection, because the carbonate under these circumstances yields white chloride, with which the other becomes mixed. The air of a drying oven heated by a gas-burner is especially bad in this respect. I have seen a surface of oxide form a coat of yellow carbonate in a few hours in this way. (Most oxide that has been kept some time will effervesce briskly with an acid.) The method is uncertain, sometimes giving strongly coloured products, and sometimes pale pink.

The oxide may be roasted in a shallow flat-bottomed porcelain basin. With a very moderate heat it changes from brown to black. When this is thoroughly accomplished, and before gray reduction sets in, the oxide is to be treated with HCl. If this be done in the basin itself after cooling, and without disturbing the position of the oxide, a curious variety of tints will be noticeable, depending upon slight differences in the heat affecting different portions.

Silver Carbonate may be roasted in the same way as silver oxide, and yields a similar product. By heat its colour changes from yellow to black; it is probable that the carbonic acid is driven off at a lower temperature than that at which oxide is reduced to silver, and that with it escapes part of the oxygen. The residue is converted by HCl into deep red chloride.

ACTION OF VARIOUS METALLIC OXIDES ON SILVER OXIDE.

If we precipitate ferrous oxide with potash, and add to this silver oxide—or, what amounts to the same thing, if we add to ferrous sulphate potash in excess, and pour over this silver nitrate solution—the silver oxide separated by the potash is partly reduced by the ferrous oxide, and when treated with HCl forms red chloride, the intensity of the colour of which depends, within certain limits, on the amount of reduction of the silver oxide.

Similarly, if we treat solution of manganous sulphate with excess of potash, and then add silver solution, we get an analogous reaction, except that it is much weaker, and heat is necessary.

With chromous oxide the action is still weaker, but evident. With cobaltous oxide it is scarcely perceptible without heat and long continued action.

ACTION OF FERRIC CHLORIDE ON METALLIC SILVER.

It has been long known that silver was blackened by ferric chloride, and this action has been proposed in the text-books as a means of obtaining sub-chloride, for which it is quite unsuited.

Ferric chloride acts on silver much as sodium hypochlorite does, but less rapidly. With hypochlorite the action is complete in a few hours, or often in an hour or less; with ferric chloride one or two days are required before the product ceases to yield silver to hot dilute nitric acid. In both cases the action seems to be alike in this: that no sub-chloride is finally left uncombined with normal chloride.

The product is an intensely dark purple black when the action takes place in the cold. With heat continued for many hours, ferric chloride can be made to attack the purple salt, and gradually convert it into AgCl. With a strong solution in large excess, kept at or near 212° F. for sixty hours, the colour was gradually reduced to pink, and finally to a dingy pinkish grey. Pure white cannot be obtained, as it can by aqua regia.

In order to observe more exactly the course of the action, a strong solution of ferric chloride was allowed to act on reduced silver in fine powder for four minutes, and then a fresh portion (always in large excess) for the same time. Analysis showed that at this stage of the action the material contained—

Ag (determined)	76·07
Cl (by difference)	23·93

If we suppose that all the silver was combined with chlorine, the constitution of the substance would be—

AgCl	92·49
Ag_2Cl	7·51
	100·00

but this was probably not the case; there was almost certainly free silver present, and consequently a less proportion of sub-chloride. Another specimen, treated repeatedly with hot acid until every trace of free silver was removed, was found to contain 1·52 per cent. of sub-chloride, colour purple. Another similarly treated contained 7·3 per cent. sub-chloride.

ACTION OF NITRIC ACID ON SILVER SUB-CHLORIDE.

When freshly precipitated and still moist sub-chloride of silver is treated with nitric acid, a sharp effervescence, accompanied with a disengagement of red fumes, sets in; presently the strong red colouration of the photo-chloride appears, and the action ceases. This production of the red and not the white chloride in the decomposition of Ag_2Cl is precisely what might have been expected, for when AgCl is formed in the presence of Ag_2Cl, more or less combination always takes place.

The action is interesting in this respect: the AgCl first formed is, at the moment of formation, in presence of all the yet undecomposed portion of Ag_2Cl, and whatever part it combines with is removed from the action of the acid. It would, therefore, seem probable that this method would be one of those that yielded a product having the largest proportion of Ag_2Cl, but analysis showed that different specimens were extremely variable; of those analyzed, one contained 8·62 of Ag_2Cl, and 6·56, and a third 1·96. All that analysis can do with such substances is to fix the limits within which they vary. The quantity of sub-chloride left after treatment with nitric acid depends partly on the strength of the acid and the time for which it is allowed to act, but also, to some extent, on variations in the resistance of the substance itself. These specimens were of shades between rose and purple.

The colour of any particular specimen is always lightened in shade by abstracting Ag_2Cl from it by continued boiling with nitric acid. But as between different specimens—especially when formed by different reactions—it by no means follows that the darkest in colour contains the most sub-chloride.

Argentous chloride, when treated with sodium hypochlorite, yields a purple form of photo-chloride. A specimen so treated contained 2·57 per cent. of Ag_2Cl.

ACTION OF CUPRIC CHLORIDE ON SILVER.

When metallic silver is submitted to the action of either cupric chloride, or, what gives the same result, a mixture of copper sulphate and ammonia chloride, an action takes place very similar to that of ferric chloride, but more energetic, and the resulting red chloride is apt to be lighter in shade, though in this respect it varies very much. As in the case of ferric chloride, this action of cupric chloride on silver is given in some text-books as a means of obtaining argentous chloride, for which purpose it is as little suited as the iron salt.

As a mode of obtaining the red chloride it is not to be recommended. It is troublesome to get the copper completely removed.

A specimen analyzed was found to consist of white chloride with 6·28 per cent. of subchloride.

ACTION OF PROTO-CHLORIDES ON SILVER SOLUTIONS.

Cuprous Chloride.—When very dilute solution of silver nitrate is poured over cuprous chloride, a bulky black powder results, which by boiling with dilute nitric acid turns red, the acid extracting little or no silver.

Ferrous Chloride.—When silver nitrate is dissolved in a slight excess of ammonia, and this solution is poured into a strong one of ferrous chloride, there results a precipitate which is sometimes greyish, sometimes olive black. By washing with dilute sulphuric acid, this product becomes brownish purple, and brightens by boiling with dilute nitric acid. It was found to contain 4·26 per cent. of sub-chloride.

PHOTO-CHLORIDE BY ACTION OF HYDROGEN.

When hydrogen is passed over argentic citrate at 212°F., as in Wohler's process, there results a black or dark brown powder, consisting of argentous citrate, metallic silver, and, perhaps, other substances. When this is treated with hydrochloric acid, and subsequently with nitric, the resulting product is photo-chloride, the characteristic colour of which sometimes appears as soon as the HCl is added. But more frequently the material after the action of HCl has precisely the appearance of silver reduced in the wet way, and the red colour appears only after treatment with nitric acid. Even cold dilute acid (by some hours' contact) will isolate the red chloride; boiling acid does so at once.

Colour, beautiful purple. A specimen analysed was found to consist of normal chloride combined with 3·11 per cent. of sub-chloride.

PHOTO-CHLORIDE BY ACTION OF POTASH WITH OXIDIZABLE ORGANIC SUBSTANCES.

There is no better method of obtaining photo-chloride than by acting on a salt of silver with potash and certain organic substances. Milk sugar, dextrine, and aldehyde give particularly good results. Milk sugar acts rapidly, dextrine slowly. Other substances with which, combined with potash, I have obtained chloride, are gum, tannin, gallotanic acid, manna, glycerine, alcohol, carbolic acid, &c. The number might, doubtless, be indefinitely multiplied. After the action has reached a proper stage—which, with milk-sugar, is apt to be in less than a minute, and with dextrine may take half an hour—HCl is added, whereupon the precipitate changes in appearance, but does not exhibit its characteristic colour until after boiling with nitric acid; the best result is obtained when the precipitate, after addition of HCl, has a rich chestnut brown shade,* which, by nitric acid, changes to shades of purple and burnt carmine when milk-sugar, dextrine, or aldehyde has been the reducing agent. When the salt of silver employed has been the chloride, of course treatment with HCl is superfluous.

A specimen obtained by acting on silver nitrate with potash and dextrine was found to contain 2·26 per cent. of sub-chloride; another, obtained with silver nitrate, potash, and milk-sugar, contained only 0·34 per cent. As in former instances, these determinations are useful only in indicating the extreme variability of these substances, and their approximate limits of composition.

OTHER REACTIONS LEADING TO THE FORMATION OF PHOTO-CHLORIDE.

A few more instances are here added, indicating the variety of ways in which this product may be obtained.

The following is an interesting reaction. If a solution of ferrous sulphate is made strongly acid with HCl, and solution of silver nitrate added, the silver is thrown down as white chloride; but if to the silver solution is first added a little ammonia, enough to re-dissolve the oxide, but much less than enough to neutralize the acid added to the iron solution, then, on pouring the silver solution into the iron, the silver falls as red chloride. So obtained it has at first a dull purple shade, but by purification, as before described, a good product is obtained. This method, however, scarcely tends to the production of the splendid copper-red shades of colour that are got by acting on silver chloride dissolved in ammonia with ferrous sulphate, and then adding dilute sulphuric acid. The shade of colour shown by any particular specimen is always of interest, because, as before mentioned, it modifies the effect exerted upon it by the spectrum.

Potassio-ferrous oxalate.—This now well-known oxalate developer, which I described some years ago, throws down from silver nitrate a black powder; this precipitate treated with HCl scarcely alters in appearance, but, washed and boiled with dilute nitric acid, changes to a deep purple.

Pyrogallol is capable of leading to the formation of photo-chloride. When ammoniacal solution of silver nitrate is poured into solution of pyrogallol in water made strongly acid with HCl, in such proportion that the mixed solutions remain strongly acid, there falls a greyish product, which, by washing and treatment with hot dilute nitric acid, becomes bright pink.

Ferrous oxide differs essentially in its action on silver solutions from ferrous sulphate. A silver nitrate solution added to one of ferrous sulphate precipitates grey metallic silver. But if potash or soda is first added to the ferrous solution, and then silver nitrate, followed by HCl, the red chloride is formed abundantly. This reaction is similar to that already described, in which an ammoniacal solution of silver is added to one of ferrous sulphate.

To the same class of reaction belong the following: silver carbonate with excess of sodium carbonate is thrown into solution of ferric sulphate, and after standing a few minutes HCl in excess is added. The silver is converted into red chloride.

It seemed possible that silver itself might be made the means of reducing its chloride. The experiment was made in this way. Freshly precipitated and still moist chloride was intimately mixed with metallic silver in fine powder and a little water. This was heated till the water boiled, and nitric acid was added. After the action was over, the chloride had assumed a deep pink colour. A similar result is obtained without the aid of heat, but the resulting colour is much paler.

Analogous to this is the following. When a cake of fused silver chloride in a crucible is reduced with dilute sulphuric acid and zinc, if the reaction is interrupted when not quite finished, and the metallic silver is dissolved out with hot nitric acid, the residue of silver chloride will be found to be pink.

When HCl is brought into contact with Ag, together with an oxidizing agent, such as a bichromate or permanganate, it gives rise to formation of coloured chloride. These I have not specially examined, but there can be little doubt that they are identical in nature with the foregoing. So, too, when silver in contact with mixed potassium chloride and chlorate is cautiously treated with dilute sulphuric acid.

The reactions above described will serve to show under what a vast variety of conditions the photo-salts are formed. Most of the methods here described represent each a whole class of reactions, all resulting in the same general way, and these classes might doubtless be largely added to. Almost any silver solution brought into contact with almost any reducing agent, and then treated with HCl, gives rise to the formation of photo-chloride. Almost any chloriziug influence brought to bear on metallic silver has the same result; or when silver is brought into contact with almost any oxidizing agent and HCl. It may be said without exaggeration that the number of reactions that lead to the formation of photo-chloride is much larger than those leading to production of normal chloride.

REACTIONS OF PHOTO-CHLORIDE.

Exposed to ordinary diffused light, all the bright shades of silver photo-chloride quickly change to purple and purple black. The darker shades are more slowly influenced.

Mercuric chloride gradually changes it to a dirty white.

Mercuric nitrate dissolves it easily and completely, but apparently with decomposition, as it can only be recovered as white chloride. Potassic chloride seems to be without effect.

Potassic bromide soon converts it to a dull lilac, which, at the end of twelve hours, showed no further change.

In contact with potassic iodide, the colour instantly changes to blue-gray. This change is produced by a quantity of iodide, too small to dissolve even a trace of silver. The filtrate is not darkened by ammonium sulphide. With a larger quantity silver is dissolved abundantly. By acting with renewed iodide solution, the substance continually darkens and diminishes until only a few black points, barely visible, are left.

Treated with dilute solution of potassium chlorate and HCl, the red substance gradually passes to pink, to flesh-colour, and finally to pure white.

The action of heat on the photo-chloride is very curious: its tendency is generally towards redness. Specimens appearing quite black are rendered distinctly purple or chocolate by heating to 212° F. in a drying oven. Often, when the substance first separates by addition of HCl, it is pure grey. This grey will often be changed to pink by simply heating to 212°. (This happens when a grey form is produced; if the greyness is due to admixed metallic silver, it is only removed by boiling with nitric acid.)

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* A specimen in this stage and before treatment with nitric acid was found to contain 92·68 per cent. of silver, showing it to be a mixture of metallic silver with chloride and sub-chloride.

The somewhat surprising change of colour which is often seen when the crude substance is boiled with nitric acid (sometimes from dull dark grey to crimson) is due to three concurrent actions—that of the mere heat, the removal of the silver, and the breaking up of uncombined sub-chloride.

It is not possible to dissolve out the normal chloride by a solvent like ammonium chloride from the photo-chlorides, leaving the sub-chloride behind. When red chloride is boiled with successive portions of strong solution of ammonium chloride in large excess, the material gradually diminishes until, if the operation is continued long enough, there remains a small residue of a warm grey colour, which consists of metallic silver, and dissolves without residue in nitric acid.

If sodic chloride is substituted for ammonium chloride, the same result follows, except that the operation is greatly more tedious. If persevered in until the hot solution no longer removes traces of silver chloride, the residue consists of nothing but metallic silver.

Action of Light on Normal Silver Chloride.

When silver chloride, precipitated with excess of HCl, is exposed to light, it becomes with time very dark. Cold, strong, nitric acid, 1·36 sp. gr., extracts a trace only of silver.

The principal action of light on $AgCl$ (precipitated in presence of excess of HCl) consists in the formation of a small quantity of sub-chloride, which enters into combination with the white chloride not acted upon, forming the photo-chloride, and thus is able to withstand the action of strong nitric acid. At the same time a trace is formed, either of metallic silver, or of uncombined sub-chloride—it is impossible to say which. After a certain very moderate quantity of sub-chloride is formed, the action of light seems to cease. This cessation has been noted by many observers, perhaps most exactly by Dr. Spencer Newbury.

The nature of the product formed by the continued action of light on silver chloride seems to support the conclusion that the sub-chloride is combined with the whole of the normal chloride after the manner of lakes rather than in equivalent proportions. If the latter were the case it seems probable that the continued action of light would extend to much greater decomposition than it is found to do.

The action of light in the formation of the so-called latent image will be examined in the second part of this paper.

Photo-Bromide and Photo-Iodide.

It has been already mentioned that bromine and iodine form with silver combinations in all respects analogous to those of chlorine. They are less stable than it, and consequently the number of reactions that lead to their production is somewhat more limited. Each, however, is formed in a great variety of ways, and with the same ease as the chloride. In colour they are for the most part indistinguishable from it, but exhibit different reactions.

Relations of Photochloride to Heliochromy.

The photochloride was examined both with the spectrum and under coloured glass.

The rose-coloured form of photo-chloride was that which gave the best effect. In the violet of the spectrum it assumed a pure violet colour; in the blue it acquired a slate blue; in green and yellow a bleaching influence was shown; in the red it remained unchanged. The maximum effect was about the line F, with another maximum at the end of the visible violet, less marked than the one at F.

Under coloured glass the colours obtained were brighter; under two thicknesses of dark ruby glass the red became brighter and richer. Under blue glass some specimens gave a fair blue, others merely gray. Under cobalt a deep blue was easily obtained, and under manganese violet, a fine violet, very distinct in shade from the cobalt. Green produced but little effect; yellow was sometimes faintly reproduced, but rarely. But the yellow glass of commerce, even the dark yellow, lets through portions of nearly the whole spectrum, as can readily be seen by testing it with the spectroscope.

The dark purple forms of chloride do not give as good results as the rose and coppery shades. These last have many points of resemblance with the material of Becquerel's films, resemblance of colour, probably of composition, as far as we can judge of the constitution of those films from their origin. They were far too attenuated to admit of analysis, and resemblance in the curious way in which their colour is affected by heat, so that the conclusion seems inevitable that they are at least closely related.

There is certainly here a great and most interesting field for experiment; hardly any two specimens of photo-chloride give exactly the same results with coloured light, and this suggests great possibilities. There is the very great advantage in this method over any previous, that the material is easily obtained in any desired quantity, and in a condition most favourable for experiment.

The action of light on photo-chloride can be a good deal affected by placing other substances in contact with it. Any substance capable of giving up chlorine seems to influence the action somewhat; ferric chloride often acts favourably, also stannic and cupric chlorides.

Evidently an important point in all helio-chromic processes is, that as white light must be represented by white in the image, it is an essential condition that white light must exert a bleaching action on the sensitive substance employed. Red chloride does not bleach, but darkens in white light; but the property of bleaching, to a very considerable extent, may be conferred on it by certain other chlorides, and particularly by lead chloride and zinc chloride.

This I look upon as very important.

Another matter of interest is exaltation of sensitiveness, and this I find is accomplished in quite a remarkable way by sodium salicylate, the presence of which at least trebles the action of light on these substances, and probably on others.

I am persuaded that in the reactions which have been here described lies the future of heliochromy, and that in some form or other this beautiful red chloride is destined to lead eventually to the reproduction of natural colours.

Philadelphia, March 23rd, 1887.

PORTRAITURE AT THE ROYAL ACADEMY.

It is difficult to regard the show of portraits at the Royal Academy as either instructive or interesting. There are over 160 canvasses, big and little, and most of them could be well spared. Why an unoffending public should be afflicted with a shower of head masters in their robes, provincial mayors in their insignia of office, and masters of hounds in hunting costume, is one of those mysteries which only the Forty R.A.'s can explain. The countenances of these respectable gentlemen are invariably supremely uninteresting, and it cannot be said that being garbed differently from ordinary mortals is a reason why they should be allowed to occupy so much wall space. The "Presentation" portrait is another nuisance. As a rule, the methodical individual who has had so many years of office as chairman of Quarter Sessions, treasurer of a hospital, or some similar post of routine is the subject of the Presentation portrait; and though his features may be gazed upon with delight by his immediate friends, it is too much to expect the general public to care a pin's point for them. Of course there are exceptions, as in the case of Frank Holl's portrait of Sir George Trevelyan, but Sir George Trevelyan will be looked upon with interest, because he is a public character, and not because his portrait is a presentation one. When the Presentation portrait, the costume portrait, and the portraits of the nobodies have been subtracted, the remainder affords very little material from which the photographer can gain any hints.

Of the leading men, Frank Holl decidedly takes first rank this year. He has lost the heaviness which was formerly too noticeable, and has combined with firmness and solidity a subtlety of treatment which adds much to the effect. His flesh tones, too, are very satisfactory, and devoid of that peculiar mannerism which disfigures so much of the work of Sir John Millais, Pettie, and even Ouless. The portrait of Sir George Trevelyan has already been mentioned. It is remarkable for the freshness of the pose, the delineation of character in the face, and the wonderful representation of nervous strength in the hands. Mr. Holl's eight contributions are all portraits of men, and, considering the rigid nature of the material he has had to work upon, he has done exceedingly well. The portrait of W. S. Gilbert (No. 300), and that of Lord Richard Grosvenor (No. 989), may be noted as unconventional in pose, and this is what the portait photographer tired of repeating himself will find useful.

All Mr. Herkomer's portraits are marked by the thought which one naturally expects from one who is so thorough, but the subjects, with the exception of a portrait of Mr. Briton Riviere (No. 683), are uninteresting. It is a sign of the times when so original a painter as Mr. Herkomer devotes himself to delineating the features of bishops and utterly unknown personages. Mr. Briton Riviere has himself gone in for portraiture this year, and in his "Portrait of a Lady" (No. 212) has given us a careful study, but with a tendency to rawnesss of colour and somewhat painty. It only needs, however, the mellowing influence of time to make the picture thoroughly acceptable.

Sir John Millais cannot be congratulated either on his portrait of the Marquis of Hartington or on that of Lord Rosebery. Each gentleman is attired in a fur-bordered coat, and to the representation of the fur the artist seems to have devoted himself. Lord Hartington's face is exceedingly beefy in appearance, and the countenance of his brother Peer, while not quite so much exaggerated in the red tones, has been as hardly dealt with. It does seem a most extraordinary thing that when a sitter goes to Sir John Millais, he or she immediately becomes abnormally florid, while those who patronise Mr. Pettie are instantaneously bilious. Mr. Pettie has done perhaps very nearly the best picture in the Exhibition in his "Two Strings to Her Bow," and has produced the worst portrait in Mrs. R. H. Pringle (No. 81). Anything more crude and glaring is hard to be conceived. His "Lady Ripley" (No. 400), with the vermilion lips, however, runs it hard in badness. If you pride yourself on your complexion, it would seem almost a calamity to be painted by Mr. Pettie.

Mr. Ouless has been as unfortunate as Mr. Herkomer. What can be said of the portraits of the Lord Mayor of London, of the ex-Mayor of Shrewsbury, of Sir Horace Jones, the city architect? Excellent, no doubt, they are as likenesses; but here all comment ceases. From Mr. Sant's prettinesses of red and white, and Mr. Horsley's vulgar oleographic portrait of a boy in hunting costume, and his painfully clean presentment of J. M. Cook, of tourist celebrity, it is pleasant to turn to the few unorthodox portraits in the Exhibition. Foremost among these is Emmeline Deane's portrait of Mdlle. Alma Belinska (No. 426), which, repellant at first sight from its cold tones, grows wonderfully upon one with better acquaintance. Filde's portraits of Mrs. W. L. Agnew, and of Mrs. L. Fildes, also deserve high praise for their freshness of treatment. Like other R.A.'s, Mr. Fildes would seem to be paying attention to portraiture, and the same may be said of Mr. E. Long, two of whose four contributions are portraits. If this tendency among the Academecians becomes general, art, pure and simple, will be left to outsiders. The reason, of course, is apparent. A successful artist thinks he is bound to live extravagantly, and he finds portraiture the best means of keeping up his income. Of course, the more portraits he paints, the larger his income. How, then, can he help taking a purely commercial view of his profession? This is a great pity, and must tend to deteriorate English art.

On the various portrait groups the photographer will almost be inclined to look with pity. Truth to tell, they are very bad. There is nothing to admire in the waxy-faced boys in P. R. Morris's "Children of the Hon. R. Meade" (No. 58), in W. R. Symond's conventional (of the worst type) group of Mr., Mrs., and Master Holland, of Benhall Lodge, Saxmundham (No. 255), or in G. E. Hicks' affected picture of Mrs. Blundell Maple and her children. "The March Past: Howard, Alan, and Nairne, Sons of Alfred Reynolds, Esq." (No. 541), of A. Stuart Wortley, can only be described as a monstrosity. The want of power which all the portrait groups display is deplorable.

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PROFESSED PHOTOGRAPHY IN NATURAL COLOURS.

A Big Swindle, or a Great Discovery—Which?

In the advertisement column of the *Times* we read:—

> Photography in Natural Colours.—Cellerier's syndicate, limited, will open their studios, for the production of photographs in colours by their patent process (Cellerier and Parkes), on Wednesday, June 1st, 1887, at prices charged for ordinary photographs.
>
> Studios:—Pall Mall Gallery, 58, Pall Mall (opposite Marlborough House); 16 and 17, Poultry, City (over Wheeler's); and 88, King's Road, Brighton, where examples may be seen and price lists obtained.
>
> Special facilities at Pall Mall for ladies attending Her Majesty's Drawing Rooms and gentlemen attending levées.

Here is a distinct profession of photography in natural colours, and if this has been realised by those who are responsible for the above advertisement, we shall have to congratulate them upon an important discovery; but if, on the other hand, they should sell coloured photographs under the representation that they are made by a process of photography in natural colours, we shall have to regard the affair in the light of a deliberate fraud—as real a fraud as that for which Belt was sentenced to imprisonment; and it will not be less so should the colouring process prove to be clever and really original.

We shall be indeed glad to find that the matter referred to does prove to be a genuine discovery, and the solution of the problem of photography in natural colours; and should this be the case, we shall heartily wish the syndicate well.

Before this is in the hands of the readers, we hope to know definitely under what heading the affair is to be classed. At any rate, the syndicate definitely professes *Photography in Natural Colours*, and their profession must either be true or false. The following is the text of our invitation to attend on Thursday, June 2nd, this card of invitation coming to hand in an envelope emblazoned with the Royal Arms, and inscribed, "Loan collection of Sir Oswald Brierly's pictures."

> The Cellerier's Syndicate having perfected a new process of photography in natural colors requests the Company of the Editor of the *Photographic News* at "The Pall Mall Gallery" (opposite Marlborough House) on Thursday next 2nd June, from 3 to 7 o'ck, to inspect a collection of the finished Works from their Studios in Pall Mall, the Poultry Sidcup and Brighton, and to witness the method of production.—E. W. Parkes, Managing Director.
>
> 58, *Pall Mall, May 27th* 1887.

Next week we will state what we learn at the inspection.

Notes.

Last week we referred to Carey Lea's important paper bearing on the realisation of photography in colours, and in accordance with our promise we now reprint it (p. 337). Reference to this and to the new salts called photo-salts of silver is further made in the leader on p. 337.

Photo-chloride, photo-bromide, and photo-iodide of silver, should their characteristic individuality be thoroughly established by subsequent research, will be interesting studies for those chemists who theorise on the molecular constitution of the elements as classified according to the so-called atomicities.

With the customary recklessness of the unscientific journalist, a leader writer on the *Daily Telegraph* has assumed that the so-called discovery in coloured photography is photography (or "heliography," as the writer prefers to call it) in natural colours, and forthwith indulges in all manner of speculations as to the probable effect of competition of the sun with the portrait painter. It does not give one much confidence in modern journalism to see daily papers following each other like sheep, and not taking the slightest trouble to make independent inquiries into the truth of the sensational statements they so readily publish. How competent the *Telegraph* writer is to discourse on the subject he has undertaken may be gathered from his description of the characteristics of a photograph. "Already we know," he gravely tells us, "from the pictures at which we peep in a camera, how Nature paints. Her foregrounds are very crisp; her finish microscopic. Her extreme distances—as they have been apparent these many years past to the visitors to the historic camera-obscura at Brighton—are apt to be somewhat vague and 'woolly.'" "Save me from my friends!" must be the fervent prayer of the discoverer of the new variation in coloured photography.

Nadar, the eminent Parisian photographer and aeronaut, has, we understand, obtained a series of very striking and characteristic photographs of the scene of the recent disaster at the Comic Opera in Paris.

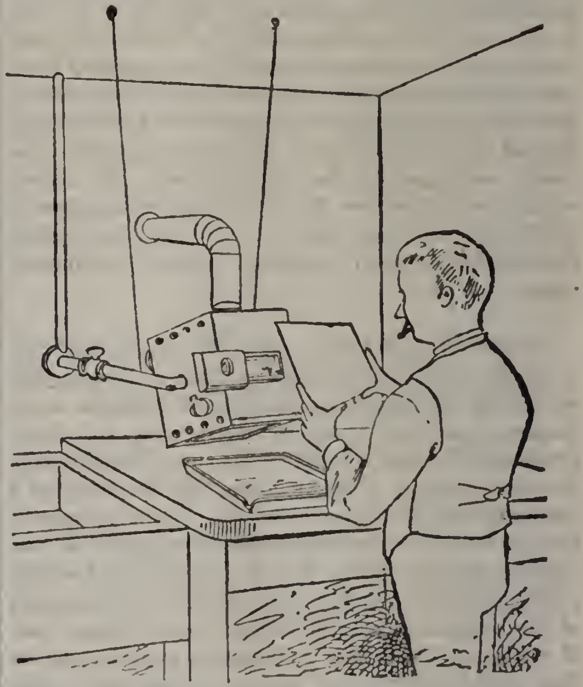
Many of those who died in the theatre were killed by carbon monoxide, a gas always produced when carbonaceous materials burn with an insufficient supply of air, and compared with which carbon dioxide—the normal product of combustion—is relatively harmless. It is also carbon monoxide which makes coal gas so specially poisonous; and doubtless Hutchinson, who came to his death while attending to a balloon at Leeds on Monday last, was poisoned by carbon monoxide.

All this has a direct bearing on the every-day work of the photographer, as when gas or oil is burnt in the dark-room carbon monoxide is formed unless there is a very free draught of air to the flame; but when the coal gas burns with a free supply of air, that carbon monoxide which it contains is completely converted into the comparatively harmless dioxide. In surrounding the flame with coloured material, in order to render the light safe, there is great risk of so impeding the draught as to lead to the production of some carbon monoxide, often enough to cause lassitude and headache.

The inherent discomforts of the ammonia charged dark-room are quite enough, without introducing a perfectly gratuitous evil like the products of imperfect combustion.

By far the best sort of lamp is one in which the products of combustion are taken quite out of the apartment, as in the lamp designed by F. C. Beach.

The subjoined sketch shows a general view of the lamp



and other drawings, of details are to be found in the current YEAR-BOOK (p. 89). Any moderately skilful worker in sheet metal should be able to construct the lamp at a reasonable charge.

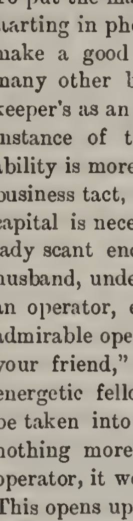
The *Bookbinder*, which is announced to appear in July, will represent an important industry which has yet had no organ in this country. Its Editor is to be J. Cundall, one of the old workers in photography, and it will be published by Clowes and Sons, of Stamford Street. Photography is even now a factor in the work of the bookbinder, and we have no doubt that its importance in this relation will be fully appreciated by the new serial.

In these days, when there is such a craving after sensational novelty, and when even the taking of a photograph is made the occasion of a determined attempt on the part of the sitter to associate his or her likeness with something quite new in backgrounds, or unprecedented in poses, we think we may be doing society a good turn by directing special attention to the recent act of an Indian potentate known as the Maharajah of Vizianagram. Now this oriental ruler is an accomplished horseman, it seems, and some few weeks since, being anxious, possibly, to amuse his subjects, he mounted a Burman pony in the compound of his Nungumbaukum residence, and, with that wilful eccentricity which appears to be characteristic of the eastern potentate, proceeded to ride it through his "Maharajahal" dwelling, and up a zigzag staircase on to the roof of his palatial bungalow. From this roof on to the top of the porch at the main entrance there is a drop of several feet, and the Maharajah, not yet satisfied with his equestrian doings, concluded his circus-like performance by jumping his pony down on to the top of the said porch. And now we come to the photographic climax. Reining in his steed in its new and elevated position, it occurred to him that to be photographed as a kind of animated finial to his own palace-gate would be an agreeably novel finish to his sensational journey, and accordingly, having shouted his orders to the attendants who had obsequiously watched his peculiar progress, the state photographer was hastily summoned to the compound with his camera, and, in a very short time, had secured several negatives of his Highness, who has taken good care that the resultant portraits shall be widely circulated amongst his admiring people.

Whether the Maharajah of Vizianagram had ever heard of the later foibles of the late King of Bavaria, who was latterly always accompanied by a photographer in his journeys, and who, it will be remembered, was photographed, but a few days before his virtual deposition, in the act of charging a mountain bear with the trunk of a small pine tree, it is impossible to say; but in any case he has, by his photo-equestrian episode, suggested a new method whereby kings, princes, professional beauties, popular actresses, and other much-photographed members of the community, can still further tickle the jaded taste of a public. The Prince of Wales, for example, who has been photographed in well-nigh every conceivable dress and position, could cause quite a new sensation by being taken in the act, let us say, of being charged on his Highland pony by a big-antlered stag at Abergeldie, or clearing an abnormally stiff "bulfinch" whilst out with the West Norfolk foxhounds. Should he more closely follow the Maharajah's example, and allow himself to be photographed whilst hovering over the roof of Marlborough House in a captive balloon, or spinning round the battlements of the Round Tower of Windsor Castle on a bicycle, it would be difficult to over-state the popularity to which the portraits thus taken would attain.

The Editor of the *Family Herald* has not a very high opinion of photography and photographers. In reply to a lady correspondent, who has evidently written to know whether she would be wise in marrying a photographer, he says: "We have been intimately acquainted, during twenty years, with the working of the business in which the young man is engaged, and we have seen more good and clever men fail in that than in any other line of work with which we are acquainted. We can assure you that artistic skill counts for very little. The beginner in business needs social tact, unblushing effrontery, insinuating manners, and, above all, money. Put the finest artist in England into a dingy studio, let him work with the best camera that money can buy, and he will fail; whereas a suave, plausible man of inferior ability will secure a good income if he starts work in elegant, well-carpeted rooms."

There is some truth in this, and a little exaggeration. To put the matter in a nutshell, it means that it is no use starting in photography without capital to enable you to make a good appearance. But this applies equally to many other businesses and professions—say a restaurant keeper's as an example of the first, and a doctor's as an instance of the second. Business tact *minus* artistic ability is more likely to succeed than artistic ability *minus* business tact, but even with business tact the condition of capital is necessary. On the whole, the Editor gives the lady scant encouragement. He cannot promise that her husband, under the most favourable circumstances, will, as an operator, earn more than £300 a year, for there are admirable operators content with half of that sum. "If your friend," finally remarks the Editor, "is an eager, energetic fellow, he may work on, increase his skill, and be taken into partnership; but if he is likely to receive nothing more than the scanty wages of a photographic operator, it would be cruel on your part to marry him." This opens up a somewhat dismal prospect of solitude for the unmarried photographic assistant, but perhaps the advice is wholesome.



Annexed is a sectional drawing of Newman's changing arrangement referred to in our "Patent Intelligence" of last week. The plates are shown as held together by the spring *d*, that plate which is farthest from *d* being at the focal plane of the lens. Each plate is in a frame, and, after exposure, is pushed upwards by the rising piece *c*. The plate can now be grasped through the flexible bag a^3, and then pushed down between *d* and the backmost plate. The flexible top shuts down close when not in use, and the whole arrangement may be regarded as an ingenious and useful improvement of the changing back invented by T. De Neck, of Brussels.

An artistic copyright case of some importance to photographers was decided last week in the Court of Appeal. The point was, whether copies of a picture made before the registration of the picture, but sold after the registration, could be so sold without infringing copyright. At the first hearing of the case a jury decided that such copies could not be sold, and awarded the plaintiffs £275 damages and penalties. However, at the Court of Appeal, Justices

Grove and Denman reversed this judgment, and decided in favour of the defendant. One feature of the case was the curious difference of opinion which existed between the judges and the counsel as to the exact meaning of the word "copyright." It would seem an easy thing to get at, but complicated by legal hairsplitting it proved most difficult.

The *British and Colonial Printer and Stationer* advises provincial stationers to add photographic materials to their stocks. This may be a good idea, and as the example has already been set by London stationers, the country dealers need not fear that if a tourist runs short of plates he will not at once think of the local stationer as the most likely person of whom he can procure them. Referring to the growth of photography, our contemporary says that one firm has sold over 25,000 cameras, which may or may not be true. We take leave to doubt, however, the statement that "the demand for dry plates, although supplied by many makers, almost exceeds the supply."

INSTANTANEOUS PHOTOGRAPHY WITH MAGNESIUM LIGHT.

BY DR. H. W. VOGEL.

Instantaneous photographs are now constantly being produced by every amateur, so that when taken in the ordinary way by daylight there is nothing in them to excite special attention. Instantaneous photography by artificial light, however, is quite a new departure, and, as shown at the last meeting of the Berlin Society for the Advancement of Photography, by Messrs Gädicke and Miethe, the process excited much interest among the fraternity.

Mr. Gädicke stated that the inventors of the process had been for the last six months engaged in working it out, but had only now arrived at the point where it might be considered as practical. They used magnesium, but had abandoned the slow burning wire for the metal in a powdered state, and this in mixture with salts containing oxygen, *i.e.*, chlorate and nitrate of potassium. This had been done by many previously, but hitherto without complete success. The essence of the process is the employment of a mixture producing such a brilliant light and burning so rapidly as to permit the photographing instantaneously of living objects. Instantaneous pictures produced by this process had been shown by Mr. Gädicke at the meeting held on March 11th, but no one had guessed the means by which they had been produced, although a lively interest was displayed by the members. The method employed was first experimentally shown by Mr. Gädicke at the meeting of the 15th of April, since when others have followed in the same path, the first to do so being E. Vogel, Jun.

The discovery of Gädicke and Miethe is, in fact, like the egg that Columbus stood on end. We, ourselves, four years since, experimented with magnesium flash-burning, but did not meet with success. At times the mixture burnt too slowly, and smoked too much. Sometimes the sitters were so much startled by the sudden blaze that we looked upon a successful photograph as out of the question, since the violent movements of the model excluded all hope of a sharp picture. Gädicke and Miethe have, however, shown us that instantaneous portraiture is quite practicable by the means indicated.

Still-life subjects, engravings, &c., have been photographed years since by the light from burning magnesium powder, but for portraits a fresh device was necessary, and this was hit upon by Gädicke and Miethe by the composition of the mixture for extremely rapid combustion, which they have brought to such perfection that the burning is accomplished in from the $\frac{1}{40}$th to the $\frac{1}{30}$th of a second. With powder thus prepared they have produced their results. My son also has on a first trial succeeded in taking a photograph of a group of six persons in a drawing-room at 11 o'clock p.m., using two grammes of magnesium powder. The exposure was made with a Steinheil's aplanatic lens, using full aperture at a distance of about three yards from the subject. The sitters were all startled by the sudden glare; nevertheless, the group on development came out perfectly sharp and properly exposed, proving that the movement of the sitters caused by the shock was subsequent to the action of the light upon the plate. On account of the want of a proper reflector the shadow side of the figures was somewhat dark, but by no means hard. The inventors have introduced a very complete arrangement for making artistic portraits and for avoiding fumes, as they showed at the recent meeting of the Society.

The powder was exploded in a lantern consisting of a strong flat case with a glass front. The can was impervious to the fumes, so that not a trace of them escaped. The lighting up of the shadows was accomplished by tinfoil reflectors, and the softening of the light was achieved by tissue paper interposed between the blaze and the sitter. In addition to this the speaker indicated another method, for use especially when interiors or large groups have to be photographed. This second method was also experimentally proved by the photographing of a group. The magnesium mixture was burned in a long trough of sheet iron, and, as a protection from direct light, sheets of tissue paper were hung in a line in front of the apparatus. A further toning down of the light may be obtained by using a second or third thickness of tissue paper, and this is so arranged in front of a portion of the line of flame as to diminish its power upon those parts of the subject that are nearest to the light, and so by comparison to better illuminate the part of the subject farthest from the light.

The inventors and I have taken in this manner a great many instantaneous groups at night time; and they have described their method in a work illustrated by two collotypes from negatives taken in a drawing room with instantaneous magnesium light.

The advantages of the method the authors describe as follows:—

"The portrait photographer is enabled by the means described to solve problems that have hitherto been either insoluble, or only overcome with the greatest difficulty.

"(1) To take portraits either by day or night.

"(2) To obtain during dull, heavy weather, especially in dark winter days, a bright, charmingly-lighted picture, by strengthening the light with a flash of magnesium light, and so giving piquancy to the illumination.

"(3) To take portraits without difficulty in the private houses of their customers.

"(4) To take sharp photographs, with certainty, of children and dogs, even in a state of the greatest unrest.

"A point of great importance is that magnesium light may now also be used for photographing interiors, since the whole illumination being concentrated in a moment, the fumes of the magnesium are harmless. They only form and spread when the exposure is over. Dark places may be lit up, and moving persons and things therein found be instantaneously photographed.

"Amateurs who have no studio erected need now no longer fear to take portrait photographs.

"The importance of instantaneous magnesium photography for all photo-chemical and physical purposes is very evident. We are now in a position, by the addition of sodium, lithium, barium, strontium, and lime salts to our light, to adapt it to the purposes for which colour-sensitive plates are used, as copying paintings, and the reproduction of coloured objects.

"It also becomes possible to produce instantaneous pictures with the highest magnifying power of our microscopes, and so to carry on researches on physiological actions, on the life of micro-organisms, on the formation of crystals, on molecular movements, &c., which have hitherto not been practicable.

"Various other applications to research, and in the arts, will be found; improvements will result therefrom, and that which is useless discarded. We therefore hope that our labours will not have been in vain. Our mixture, as well as the principle of our method of burning, we have protected by patent."

[See Review of book by Gädicke and Miethe on p. 350.]

A NEW (?) PROCESS OF COLOURING PHOTOGRAPHS.

BY T. G. WHAITE.

It has often been said that "there is nothing new under the sun;" but I see, in a recent issue of the News, the *Newcastle Weekly Chronicle*, and other papers, we are to expect something akin to photography in colours, at last. Of course, the how the thing is done is a "profound secret." Is it? An amateur said to me yesterday, "It's not done with a brush and colour, or by any mechanical means, but by the spectroscope." I enquired if he knew what the spectroscope was. "Well, no; not exactly." I fancy he was under the impression that it was a kind of scientific trowel, by which the colour was spread on. I imagine the "new" process will turn out to be one of our old dead and gone friends (?) revived—one of the old white wax, paraffin, or crystoleum methods, of which we have had too many, their chief merit being, so the *sellers* of the process and the pupil say, that anyone, however ignorant of art or drawings, can produce life-like paintings in a few minutes.

It is now twenty-five years since I first tried my hand at this kind of colouring, to enable me to meet the demand for a cheap coloured photograph; and, though the results pleased at the time, they never satisfied me, and I returned to what its advocates call the "brush and mechanical" means of painting a photograph on the surface.

My first productions were made on very thin Rive paper, such as was then made for negatives; albumenized, salted, and then sensitized by *complete immersion* in the silver bath; printed in the ordinary way, and very slightly toned to preserve a warm tone in the shades. This print was then, whilst wet from the washing, mounted on a stretcher, dried, and then brushed over with hot white wax, held before a fire, and superfluous wax rubbed off with blotting paper. After this treatment, a rough, bold colouring at the back of print on a desk like our retouching desk of the present day. This was best effected by oil colours, with a little japanners' gold size to ensure quick drying on the waxed paper, and afterwards backed up with white or tinted cardboard, and framed. After a time, I found the white wax yellowed, and became an objectionable colour; and I then used, with varying success, Venice turpentine, castor oil, and finally solid paraffin, which latter retains its purity of colour if not burnt in the heating.

The next method was to produce an exceedingly lightly printed impression on albumenized paper, toned to a very warm tone, *having stopped out on the negative* all portions that photographed too dark for the back colour to show through, such as the shadows of gold brooches, red or coloured ribbons, slightly marking the shadows of the hair and any other dark patches; take this unmounted print, soak it in solid paraffin, remove superfluous wax with a hot iron between several folds of blotting paper, and leave it transparent (this must not be touched with colour at all), then print on plain salted paper, such as was then in use, but now I should use ordinary albumenized paper, sensitized by complete immersion in the silver bath, and printed on the plain side of paper. This plain print was then strongly coloured with water colour, putting on plenty of colour, and placed in optical contact with the transparent print. This was best effected by placing between two glasses, and hermetically sealing. The effect produced will, I think, come astonishingly near the new chemico-spectroscopic, or whatever they are called, pictures.

What is called the "crystoleum" I need not go into. It is used up for the present, no doubt to be revived again as new next generation. But there is yet another method I should like to explain: one that combines the colours behind the print, colour on the surface, and also enamelling, and, though a little complicated, is by no means difficult.

Take an unmounted albumenised print, and with a little very fine pumice powder rub over the face and parts requiring colour to give the surface a "tooth." Wash the surface with a brush and clean water, then with rose madder (water-colour) and a little orange vermilion; tint the face and hands; a broad wash roughly over the flesh is all that is necessary, no skill being required. When dry, clean off with a brush and water any colour that has run over the edges of face or hands, and take out the lights or the colour from the white parts of eyes. Then for lace, gold, &c., that appear too dark, colour with a little body colour—*i. e.*, colour mixed with a little Chinese white, or the colours that possess sufficient body in themselves; tint the upper lip, which is always dark, with Indian red and rose madder; the Indian red, possessing a great amount of "body," will cover the dark shadow well. It is now finished so far as the front of the picture is concerned, and this may all be done in a few minutes.

Now take the print, lay it face down on a hot slab or sheet of iron heated, covered with several thicknesses of blotting-paper, and with a block of *solid* paraffin (wax), rub on the *back* of the print until it looks thoroughly saturated with the paraffin; remove all superfluous paraffin with a clean cloth from *face* and back (the colour will not move now), and with clean cotton rub over both sides with a little clean paraffin *oil;* leave it to soak in for two or three minutes, rub off the oil, dip it into a gelatine solution hot, and squeezee it on a glass plate previously prepared for enamelling with collodion; wash all gelatine off the back with sponge and warm water; when dry, colour on the back with water colour, again dry, and pass over it paraffin oil lightly, with cotton, and after allowing it to remain on three minutes, *dab* it off(do not *rub* off); this is all done whilst the print is in contact with the enamelling glass. It is now only necessary to gelatinize the mounting paper, and squeezee to the print, and when dry, strip it from the glass.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

The local committee held a meeting at Glasgow on the 26th of May. John Stuart, chairman of committee, presided. Final arrangements were made for the Comvention meeting on 4th of July.

It was arranged to hold evening meetings from Monday to Friday inclusive, with the exception of Thursday night, which will be left free. Six excursions were agreed upon, giving a choice of two on Tuesday and two on Wednesday, leaving one for Thursday and one for Friday. The details of these meetings and excursions will be given in a programme of the week's proceedings. This programme will be in the hands of members of the Convention some time before the meetings. Attention is directed to the Circular issued by the Exhibition Committee.

The importance and success of the Exhibition is already assured by the number of requests for space sent in by professional and amateur members of the Convention, and every member who possesses anything whatever of interest to the craft should take this excellent opportunity of exhibiting.

The Circular referred to is as follows :—

Exhibition at Glasgow, week commencing July 4th, 1887.

1.—The Exhibition shall form part of the Convention meeting ; is not competitive or public in its character, and is intended for members and their friends only.

2.—The Exhibition is intended to include every class of photographic work and apparatus, and exhibits are requested from any member, whether professional, amateur, manufacturer, or dealer. Members are solicited to show anything whatever of special interest, whether old or new.

3.—Exhibitors must be members of the Convention.

4.—The Committee will be ready to receive exhibits on 14th of June, and not later than 24th of June.

5.—All packages to be addressed "Photo Convention, Institute of the Fine Arts, 175, Sauchiehall Street, Glasgow."

6.—All forwarding charges to be prepaid by the sender.

7.—Exhibitors are requested, on forwarding goods, to advise the Local Secretary, and to enclose address label for return.

8.—Exhibitors are requested to attach to all exhibits a card, describing process, &c., and giving name of exhibitor. These cards to appear in a prominent position, as it is not intended to prepare a catalogue.

9.—For the convenience of exhibitors at a distance from Glasgow, the Committee will repack and forward goods after the meeting.

10.—Local exhibitors are requested to remove their exhibits within three days after the close of the Convention.

11.—The Committee will take every reasonable care of exhibits, but they cannot undertake any responsibility for loss or damage.

James Davie, *Hon. Local Secretary.*

36, Darnley Street, Pollokshields, Glasgow.

* * *

NOTES ON SOME AMERICAN STUDIOS.

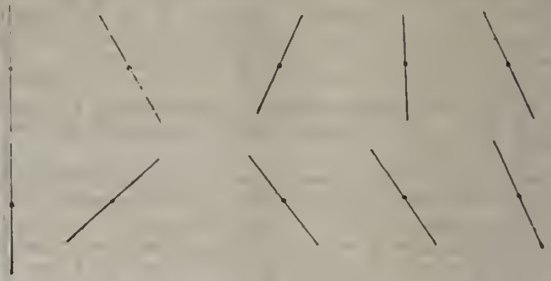
BY W. K. BURTON.

American portraiture is so well known in England, or, for the matter of that, I suppose, all the world over, that a few words on a couple of New York studios or "galleries" which I recently had the pleasure of visiting may not be uninteresting to English readers. It was through the kindness of the editor of the *Photographic Times* that I had the opportunity of visiting these ; of which kindness, were it not a purely personal matter, I should like to say much.

The name of Mora is so well known in Britain that it was with pleasure I hailed the opportunity of calling on the great man. Mora is a much younger man than I expected to see, considering that I was familiar with his work, even north of the Tweed, I think quite fifteen years ago. He has not the appearance of being over forty. He received me with great cordiality, and was kind enough to let me see the whole of his establishment, which is of quite historic interest, having been the first Daguerreotype gallery in America. It was opened in the year 1841 by J. Gurney, who did a very large business in Daguerreotypes from that time till the glass positive superseded the older form of sun painting. The magnitude of his operations may be imagined from the fact that he was in the habit of turning out portraits as large as 17 by 11 inches, and that he found it worth his while to have a steam engine to work the wheels on which he polished the plates. These particulars I had from Mr. Gurney himself, whom I afterwards had the pleasure of meeting.

As might be imagined, a studio which has been in use for over forty-five years has little of the varnish of newness about it. Indeed, Mora appears to be by no means desirous of show. The gallery is, I imagine, not very different from what it had originally been, and one was impressed with the generally unassuming appearance of a place so well known.

The studio itself is sufficiently large, without being by any means colossal. It faces, I think, to the north, and, whilst I was in it, at any rate, work was carried on with a great deal of light, one reflector only being used to light up the shadow side of the face. This is divided horizontally, each half being on hinges, so that it can be caused to take any of the following forms, or various others, according as it may be desired to cast the light upwards or downwards, or horizontally.



Mora's method of posing is quite different from that of any other photographer I have seen working. He studies the face for a few moments, first one side and then the other, and appears at once to make a mental note of what sort of picture he will make. He places a chair in position, and immediately that the sitter is in it, goes right up to him and adjusts his head, &c., not appearing to need to look what the effect will be from the camera, but knowing by instinct—or rather, I suppose it really is by great skill and long practice—what the effect seen from the camera will be. He adjusts the reflector, fixes a mark for the sitter to look at, and leaves all the rest to his operator.

Mora still prefers to use wet plates rather than dry whenever he can, wherein I believe he stands alone amongst New York photographers. I could not get him to give me a very definite answer as to why he prefers it. He would not commit himself to any opinion that he got better results, and, indeed, beyond saying that he could with a wet plate see at once what his result was, he would give no reason.

I had the honour of sitting to Mora. He made in all six exposures—or, to speak more strictly, he posed me for six exposures—two on each of his wet plates, and two on a dry plate.

I noted that the exposures on the wet plates were from twenty to thirty seconds, whilst those on the dry plate were only about three seconds. With the wet plate, the lens—a Dallmeyer portrait lens, 3B, I think—was used, nearly full aperture ; with the dry plate, a stop about one-third the diameter of that used with the wet plate was inserted. Now it follows, from this, that whatever may be the average ratio of the rapidity of wet and dry plates, the particular dry plate used on this occasion was at least eighty times as sensitive as the particular wet plate.

I saw all the plates developed, the wet plates in the usual way coming up very rapidly, and requiring no intensification or re-development. The dry plate developed with a slowness and caution very different from what is customary in the dark rooms of studios in England. I think quite twenty minutes were occupied in bringing it up ; but I was told that, as a rule, development went on more rapidly. Undoubtedly, the result was a negative of magnificent quality.

I may mention that Mora—or, rather, his assistant, because, as I have said, Mora himself confines his attention to posing merely—works dry plates by artificial light filtered through "Debenham's" medium, in which he strongly believes.

It is well known that American photographers do much more work than English in large portraits taken direct, and Mora is no exception to the rule. I saw huge piles of negatives from which prints might be made on whole sheets of paper. Of course, for these, dry plates are used, and little seems to be thought of negatives about 24 by 18 inches in size.

I saw, at the Scovil Manufacturing Company, a camera which had been made for some enterprising individual who intended to go in for direct portraits on plates 34 by 24—a goodly size, surely. Enlarging appears to be comparatively unpopular with American photographers, and certainly the impression made on me by the large direct portraits that I have recently seen is, that there is something in them which enlarging will *not* give.

The price that Mora charges is, I understand, 14 dollars (say £2 18s.) for a dozen cabinets; 10 dollars (say £2 2s.) for half dozen; and I imagine that he has no difficulty in getting the price.

The next studio that I saw was one of a very different character from that just described. It is the gallery of C. D. Fredericks. This is an establishment for turning out large quantities of work at comparatively low prices. Not that there was anything of the "cheap and nasty" about the work sent out by Fredericks; on the contrary, it would rank in England as excellent portraiture. The general aspect of this place is the very opposite to that of Mora's. Here everything is magnificent to a degree. The reception room, which occupies the whole of the ground floor, is really quite a picture gallery, and is a place when an hour or so might very comfortably be spent.

Again, I was allowed to see whatever I wished through the whole establishment. Upstairs there are two studios where dry plates only are used, and where, at times, Fredericks told me as many as 250 sittings a day are got through. The printing part of the establishment is on the roof, and it is not unusual, I was told, to turn out as many as 1,500 prints in a day, the smallest size being cabinets, for I should mention that the carte appears to have entirely disappeared in America, or in New York, at any rate. The prices charged are 5 dollars (say £1 1s.) per dozen cabinets, but I understand that a great deal of "club" business is done. In this a certain number—I think a minimum of six—form a club, and get a very substantial reduction in prices; in fact, from five dollars to three, the latter price (12/6) being one which would be considered very low for even tolerable work in England.

In both the establishments that I have been writing of I saw the printing department, concerning which let me first of all say, that the light in New York is of such a character that it is not necessary, as it is generally considered to be in London, to have a separate printing establishment at some distance out of town. Each photographer does his own printing at the top part of his own house.

The favourite albumenized paper in both Mora's and Frederick's house is of German manufacture evidently, by the smell of it, from the same source as a very favourite brand of paper in England. The paper after sensitizing is hung up by American clips at two corners, right over a row of Bunsen burners, the heat of which serves to dry it, the products of combustion of which appear to be in no way feared. When dry the paper goes to the fuming box, which is simply a rectangular box or cupboard in which the paper may be hung vertically, and on bottom of which may rest a dish of liquid ammonia.

Fuming is, as is well known, universal, and all but universal in America, and I must say that the impression produced on me by the results I saw was that it is wise to use it. Taken all round, there was a greater richness in the prints than I have been accustomed to see at home, and this certainly not due to the paper used—for that in the instances I have been referring to was of a well-known European brand—but due, I feel sure, to the fuming, and to that only. A deep purple or almost black tone is the one most affected. I saw little or nothing of the warm browns now so popular in England.

A few very good platinotype prints of large size and excellent quality I saw; but this printing process appears not by any means to have reached the popularity that it has "on the other side," nor has the gelatino-bromide process, but this latter follows naturally from the fact already stated, that enlarging is much less made use of.

Gelatine dry-plates—both bromide and chloride, I believe—are specially prepared for lantern slide and general positive purposes, but, so far as I have seen, only the black tone is affected. I do not know whether because, as in the case of prints on albumenized paper, the brown and reddish colours are not cared for, or because difficulty is found in getting these colours.

On the whole, I think the Americans well sustain their reputation for supremacy in the matter of portrait work, certainly at any rate where large sizes are concerned.

PHOTOGRAPHING BY GASLIGHT.

BY JOHN BARTLETT.*

There is nothing novel, nothing strange in the fact that certain salts of silver are sensitive to the moderate amount of actinic force contained in the flame of ordinary illuminating gas. Quite early in the reign of collodion some excellent work was accomplished by the use of such illumination in photographing interiors and dark places, but the difficulties attending the operation, the length of time required for exposure, and the consequent danger of the drying of the plate, did not contribute much to the popularity of the process. In fact, it was used only in extreme cases; frequently, merely to show the possibilities of the method. With the advent of the extremely sensitive bromide of silver gelatine dry plate, one might suppose it would have advanced in favour; but the superiority in power, convenience of application, and cheapness of the electric light, considerably depressed the general interest for it as an artificial source of illumination.

Portraits have been successfully made by gas light, and even apparatus devised to utilize to the best advantage the force of the flame, but I think it may be safely said that at present no gallery in the world employs it. Our object is not to show the superiority of gaslight over the other artificial illuminators, though we do think, had it been allowed, in the struggle for existence, to appropriate more of scientific and general interest, it would have differentiated much further, inasmuch as it possesses certain inherent good qualities which its more favoured rivals cannot claim; we merely wish to call attention to its great value in photographing interiors. Indeed, in this province of the art, it possesses advantages over daylight in softness of the general effect.

In our experiments we did not use any apparatus whatever, not even reflectors, employing merely the light of the ordinary burners, protected by ground-glass globes. The source of light was not intense, five bat-wing burners of a chandelier suspended from the centre of the room, 15 by 30 feet, the camera being placed at either extremity, and hence necessarily directed towards the light, but low enough to prevent the flames appearing on the ground-glass. A Ross rapid symmetrical lens, six inch focus, was used, and exposures given from ten to twenty minutes. The results, we imagine, no one would be able to distinguish from good interiors taken by daylight.

We have photographed the same room when illuminated by diffused sunlight, but have not obtained results as uniform in lighting. Daylight gave more violent contrasts, the darker portions of the room lacking much in detail, while the highly illuminated parts were too intense. It is especially on account of the evenness and general distribution of the light that we prefer gas to ordinary daylight. Its advantages over burning magnesium wire are even greater. Our experiments with this pure white illuminator gave very harsh contrasts in light and shade, although we sought to modulate its action by tissue screens, and by distributing the illumination as much as possible. We did not try the electric light.

The exposures of ten minutes with gas lacked somewhat in detail, showing undertime; but those of twenty minutes were pretty rich in detail, even in the deep shadows. The plate we employed was, of course, the highest sensitometer number we could secure—some of Cramer's recent extremely sensitive brands. With the twenty minutes' exposure, we developed with pyro and potash—of the ordinary stock solutions:—

Pyro	... 2 drachms
Potash	... 1 drachm
Water	... 2 ounces

which sufficed to bring up all the detail, and to give good density without any extra addition of accelerator, which, we think, demonstrates the truth that an evenly-lighted subject really requires less time with a moderate light, than one violently illuminated with a strong light.

---

* Read before the Photographic Society of Philadelphia.

While making these gaslight photographs, we were induced to try the action of the yellow gaslight in rendering the colours with orthochromatic plates. Carbutt B plates and Seed plates were first placed in a preliminery bath, consisting of

Ammonia	1½ drachms
Water (distilled)	7 drachms

and allowed to remain for a minute or two. They were then transferred to the orthochromatic bath, made according to the formula given in a package of Flandreau's orthochromatic solution, kindly sent by the Scovill Manufacturing Company:

Water	5½ ounces
Erythrosine	1½ drachms
Ammonia	2 „

here they were rocked for a little over a minute, taken out' drained and dried in an ordinary drying closet. They were exposed upon objects of blue, yellow, red, and green colours, without the interposition of the yellow screen, making use of the light of a coal oil lamp with a reflector placed near the objects, in addition to the light of the gas flames. The time of exposure with the B plates was fifteen minutes; with the Seed, two minutes. The ordinary developer of potash and pyro was used. I was troubled much with fog, especially with the Seed plates, whose sensitiveness was probably affected by the ammonia employed, but the results obtained in the rendering of the yellow and orange were surprising. I have a couple of prints, one from the fogged Seed plate, two from the clear Carbutt plates, which show this remarkable action. The oranges in the basket were very orange in colour, while the flowers were hyacinths of the palest blue, almost white—nevertheless, the deep so-called adactinic colour of the fruit is rendered as a high light, as in nature, only a few degrees below the flowers.

In the other picture, the long-necked vase is of a bright chrome yellow colour, which ordinarily is translated dark, the vase immediately behind it is ultramarine blue, the large urn light green, while the recumbent vase is vermilion. This last has scarcely taken better than with an ordinary plate. The erythrosine therefore would seem to depress the action of the blue, and to render the yellow, orange, and green in their true relations, but not the reds. Probably it would make an excellent plate for the yellowish greens of spring foliage.

I will confess I made some attempts at portraiture with ordinary plates by gaslight. I found, by using a small hand reflector of cardboard and a shader, one might, if possessed of the skill, model in an artistic manner the head by directing the light and shade to any desired part. Of course means could be devised to shorten the time of exposure to less than a minute, and by keeping the reflector and shader in gentle motion, any required degree of light and shade could be secured, and much softness given to the image.

One recommendation has photography by gaslight: it is independent of time and season and state of weather. We could not help noticing how strange it was for us to be taking pictures in a warm, cosy room, while without the wind and the rain were striving for mastery.

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Review.

Praktische Anleitung zum photographiren bei Magnesiumlicht: Von J. Gadicke und A. Micthe. Octavo, 34 pages, price not stated. (*Berlin*, 1887: *Robert Oppenheimer.*)

In this little book the authors give the necessary instructions for photography by the magnesium light, according to their new method of working, as referred to by Dr. Vogel in his article, which appears on page 346.

The essence of the method consists in burning a mixture of magnesium powder and chlorate of potassium; but these materials alone are not satisfactory, it being necessary to add some rapidly-burning substance to ensure the sudden combustion of the magnesium. Sulphide of antimony answers well, and the following formula is given:—

Chlorate potassium	60 parts
Magnesium powder	30 „
Sulphide of antimony (commercial black antimony)	10 „

The chlorate of potassium must be finely powdered in a mortar, but the other materials are usually sold ready in a fine powder. All materials must be dry, and the mixing is performed as follows, the parts being taken as grammes:—A quantity of 60 grammes of finely powdered chlorate is sprinkled over a sheet of paper, after which the magnesium powder (30 grammes) and the black antimony (10 grammes) are added, and the mixture is effected by means of a wooden spoon, or else by rolling the mass over by alternate raising and turning up of each edge of the sheet. At any rate, the mixture must be thorough. The mixture should be kept in small tin boxes holding about 50 grammes, and stored where an unexpected ignition will do no harm.

The powder can be ignited by the end of a burning cigar or a hot coal, but its explosion is so sudden that when a considerable quantity is lighted, care should be taken to protect the hand. In order to avoid the clouding of the air by smoke, a simple form of lantern is recommended: a rectangular glazed box with a smoke tube, and a small door for the insertion of the powder and lighting it.

By the light from the combustion of one gramme of the mixture, the authors took a head and bust portrait, which accompanies the book; while three grammes served for a pretty little group picture showing mother and daughter at the fireside.

The book appears to be honestly written, and to give full working details of the whole process; the process is, however, patented (we suppose the English application for patent No. 7035 refers to it), and unless photographers are meaner and more dishonest persons than we believe them to be, if they infringe the patent just because they can do so with ease and probable security. Gädicke, of 74, Ritterstrasse, Berlin, sells all the materials and apparatus at very moderate prices, and of course purchase from him carries the right to use.

◆

Patent Intelligence.

Applications for Letters Patent.

7549. John Deakin, 171½, Unett Street, Birmingham, for "Improvement in metallic easel or stand for photographs, cards, and other like articles."—25th May, 1887.

7601. Stuart Edwards, 33, Queen's Down Road, Clapton, London, E., for "An improved standing arrangement or device for cards, programmes, photographs, pictures, advertising matter, or the like."—25th May, 1887.

7737. John Harrington, 23, Southampton Buildings, Middlesex, for "An improved method and apparatus for photographic printing."—27th May, 1887.

7790. Alfred Julius Boult, 323, High Holborn, Middlesex, for "Improvements in photographic apparatus."—(*Henry Smith Crocker*, United States.)—[Complete Specification.]—28th May, 1887.

Official Abstract of Accepted Complete Specifications.

Samuels, 9645, 1886. "Cameras (including Lenses and Lens Fittings.") Focussing with lever instead of rack and pinion.

Clark, 6076, 1887. "Cameras." Revoluble drum inside camera has inclined mirror for focussing on horizontal plate, and side aperture for exposing.

Samuels, 9645, 1886. "Changing boxes and slides." Change box with two compartments, both full, and having transfer devices at front and back; plate canting devices.

Samuels, 9645, 1886. "Change boxes and slides." Change box with flexible bag at top for transferring from front to back; shutter acts as lifter.

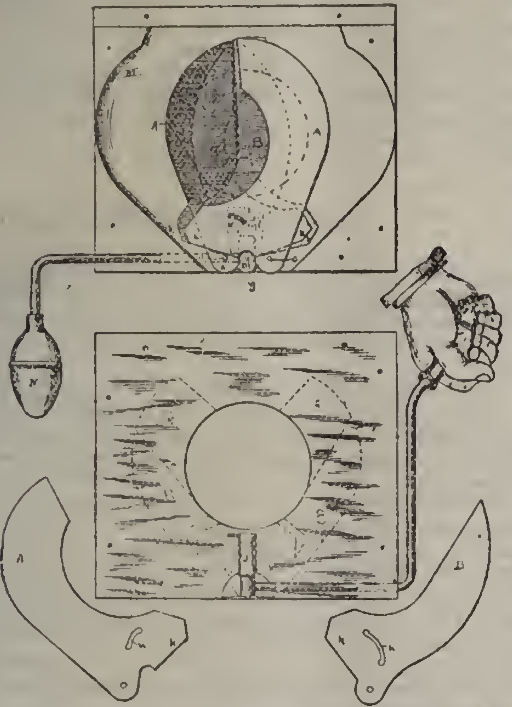
Clark, 6076, 1887. "Shutters." Exposure made by aperture in side of revolving drum passing in front of lens.

Mayfield and Todman, 14,410, 1886. "Shutters." Slide with hole raised by piston operated by fluid, and after exposure allowed to drop.

Parker and Lee, 15,697, 1886. "Tripod and like stands." Legs held together and connected to camera, colour box, &c., by clamps operated by winged nut.

Patents Granted in America.

362,211. George F. Green, Kalamazoo, Mich., "Photographic shutter."—Filed Dec. 29, 1886. Serial No. 222,902. (No model.)



Claim.—1. A photographic shutter provided with four wings, A A B B, overlapping each other and having different ranges of movement, whereby they are enabled to fold back into the case side by side, substantially as set forth.

2. A photographic shutter provided with wings A A and B B, the former pivoted on pins *d c*, respectively, and the latter pivoted on the centre pin *g*, said wings being provided with foot-extensions *k*, whereby, in closing over the aperture, each wing reaches over and is arrested by the pivot-pin of the opposite shutter, substantially as set forth.

3. A photographic shutter provided with wings A A, centered on the pins *d c*, respectively, and each having a slot, *h*, and wings B B, pivoted on the pin *g*, and each provided with a slot *h*, and a moving piston J, provided with a pin *i*, which passes through and engages all of said wings in the several slots *h*, and thereby coincidently actuates all of said wings.

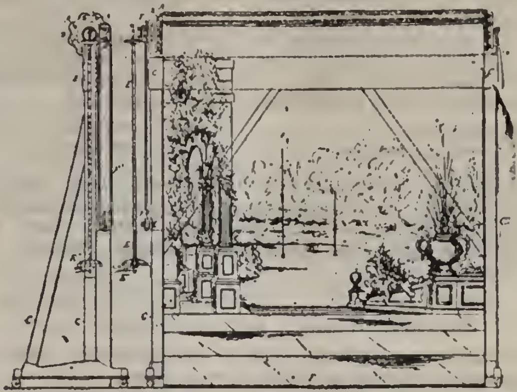
362,390. George W. Morgan, Aberdeen, Scotland, "Multiplex photographic background."—Filed April 15th, 1885. Serial No. 162,337. (No model). Patented in England June 4th, 1884, No. 8566, and in France October 10th, 1884, No. 164,719.

Claim.—1. The combination of the frame and a rotary holder with rollers journalled in the holder, and each carrying a background and a locking-spindle to retain the holder in the position to which it has been moved.

2. The combination of the frame and a rotary holder with rollers journalled in the holder, and each carrying a background and a sliding-spindle in the frame adapted to engage with the journal of any roller and carrying a pulley, as and for the purpose specified.

3. The combination of the frame and a rotary holder with rollers journalled in the holder and each carrying a background, a vertical spindle geared to the holder, and a locking-spindle to retain the holder in the position to which it has been moved substantially as specified.

4. The combination of the frame, rotary holder, and back-



ground-rollers journalled in the holder with a vertical hollow spindle E, geared to the holder and having a handle E′, a sliding spindle *f*, bell-crank *g*, spindle H, and operating hand-lever, all substantially as described.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 25th ult., the chair being occupied by H. S. Starnes.

W. H. Prestwich handed round some Parisian street views received from M. Stebbing.

L. Medland exhibited Newton's shutter designed to work in the diapragm slot by means of a metal plate. It was arranged for regulating exposures from a fraction of a second to many minutes.

C. Heinrich Trinks handed round a Beck lens fitted with the Iris diaphragm.

In reply to the Chairman, several photographs were handed up—the results of members' attempts to photograph the Derby race and scenes on Epsom Downs.

Reference was then made to Mayall's colouring process, after which J. B. B. Wellington read an extract from an American journal relative to Carey Lea's recent experiments in colour photography.

The following question was then read and discussed—"What is halation? How is it caused? How can its evil be mitigated?"

The usually accepted hypothesis of reflected light from the back surface of a glass plate was mentioned. It was also stated that at a meeting of the Photographic Club recently, Mr. Walker had attributed halation in paper negatives to the particular mode of development: a large proportion of pyrogallol would cause the effect of halation, when the same paper under different conditions of development would be free from the defect.

E. Clifton said that subjects liable to show halation should not be developed very far, it being a better plan to have a thin image, and resort to after-intensification.

C. H. Trinks overcame the difficulty by using a stained film. He then asked what was the highest speed practicable for any shutter when moving objects had to be taken, all other conditions being favourable? As the eye could not distinguish an object that travelled faster than one-sixtieth of a second, could a shutter?

W. E. Debenham used a shutter which was timed to act in $\frac{1}{35}$th of a second, that was practically $\frac{1}{70}$th of a second over the entire lens. He used $\frac{7}{8}$ on this occasion, and got full exposure.

A. L. Henderson remarked that his shutter for the Derby race a few years ago was timed for $\frac{1}{250}$ of a second. The horses were moving at their highest speed.

A. Mackie preferred diamond shaped openings passing through the lens tube in opposite directions. This arrangement would be found fast enough for most purposes.

"Is dextrine good for mounting?" was put as a question, but only one member spoke favourably of it, while several objected to its use.

North Surrey Photographic Society.

At the meeting held at the Greyhound Hotel, Dulwich, on May 25th, A. **Rider** in the chair, T. **Marsh** read a paper on "Amateur Plate making."

Mr. **Marsh** went through the performance of the details of making an imaginary emulsion. using only a few ordinary household utensils for the work. The various stages of the process were accompanied with lucid directions and explanations. Mr. Marsh stated that a good emulsion can be made at an approximate cost of one penny per ounce, which quantity will coat six quarter plates, or one 10×8. He also described the making of an emulsion by the ammonia nitrate method, by which the trouble of washing is avoided. This process is so simple and cleanly that it may be performed in a sitting room. Some negatives were handed round which contained about a grain of silver in the film of each.

Liverpool Amateur Photographic Association.

The monthly meeting was held on the 26th ultimo, at the Royal Institution, **George H. Rutter** in the chair.

Charles A. Colman was unanimously elected a member.

Mr. **Rutter** read a report of the excursion to Chester on May 7, from which it appeared that twelve members and two friends took part, that one hundred and nine exposures were made, fifty-nine on plates, forty-two on paper, and eight on Pumphrey's films. Mr. Rutter also reported that on May 18 an excursion took place to Sandbach and Morton, when eleven members were present, and one hundred and twenty plates were exposed.

Mr. **Earp** read a short account of the excursion to Worsley and Wardley Halls on Saturday, May 21, when only six members took part in the trip.

The discussion on "Detective Cameras" was then opened by **Paul Lange**, who exhibited and explained one of his own construction, in the shape of an innocent-looking brown paper parcel, containing quarter-plate camera, Ross' rapid symmetrical lens, Eastman's roller slide, with Rodger's indicator and Kershaw shutter, thus forming a very complete instrument; also some specimens of very fine work done by its aid.

Mr. **Driffield** showed his modification of Marion's Academy camera, consisting of the addition of a focussing mirror. The camera works plates two inches square, and some fine enlargements were shown from these plates.

Messrs. Swinden, Kerry, and Comber, also exhibited detective cameras showing slight variations, but generally on the principle of the brown paper parcel.

Dr. Kenyon, and Messrs. Sayce, Tomkinson, Kerry, and Driffield, exhibited a considerable number of prints and other work.

Mr. **Mayne** exhibited Anderson's metal developing dish with attachment for lifting the plate out of solution; also Shew's folding rack for drying negatives, which shuts up into a very portable form.

Photographic Society of Philadelphia.

A meeting of the Society was held on May 4th, with Vice-President **Bullock** in the chair.

C. **Browne** announced the death of James E. McClees, an old Philadelphia photographer, who, though not a member of the Society, he thought well deserved mention in the minutes at this time. Mr. McClees was one of the pioneers in the art in Philadelphia, and was well and most favourably known to the older members. Mr. Ellis and Mr. Bell also added tributes of respect to his memory, alluding to the freedom of access to his laboratory formerly enjoyed by amateurs, and the help he was always ready to give at a time when every new discovery was jealously guarded by most professional photographers.

The papers of the evening by Mr. Rosengarten on "Photographic Chemicals and their Technology," and by Mr. Bartlett on "Photography by Gas Light" (page 349), were read, and listened to with interest.

The **Secretary** showed a new model Prosch duplex shutter, the special features being a new form of release of great delicacy and certainty of action, and a revolving diaphragm which entirely did away with loose stops, making a combination of lens, stops, and shutter, with no loose parts liable to be lost or left behind. The rapidity of action of the shutter was also understood to have been increased.

T. **Vaux**, alluding to statements which had been made in the *Philadelphia Photographer*, that the so-called photographs of lightning flashes are in reality only pictures of the illuminated edges of clouds, showed a series of pictures he had made of sparks from an electrical machine. From one to twenty sparks were included in each negative, and their form was so precisely similar to that of lightning flashes that there could be no question that lightning pictures were what they claimed to be.

J. L. **Walmsley** showed some blue prints made upon postal cards, which were prepared and sold ready sensitized for the purpose.

Talk in the Studio.

North London Photographic Society.—On Saturday, June, 4th there will be an excursion to Loughton. The train leaves Liverpool Street (G.E.R.) at 2.35 p.m.

Photographic Club.—The subject for discussion on June 8 will be "Vigneting and Finishing Photographs." Saturday outing at Gravesend from St. Paul's Station, Victoria Street, as near 2 o'clock as possible.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

C. R. King.—We have obtained the best result by grinding one side of a piece of good patent plate with the finest flour emery. The flat part of a stopper can be used as a muller, and if there are any coarse particles in the emery, it must be elutriated. An ordinary wet plate film with the iodide in it also answers very well; but, in any case, when the grain is very close, so as to enable one to appreciate fine definition, one loses in respect to vigour of image.

C. E. Shaw.—We believe that they have left the premises, and that the firm mentioned no longer exists.

Lex.—Not very recently.

Sunlight.—Without knowing something of your qualifications for the work, we cannot give you a useful opinion as to your chances of success. Give further particulars, and we will do our best to assist you.

D. Evans.—In this case, we believe the prices to be fairly in proportion to the merits of the respective instruments, and it is really a question for the purchaser to consider how far he can go.

A. B. C.—Thoroughly fume your paper, and tone in a chloride of lime bath:—

Chloride of gold	2 grains
Precipitated chalk	20 ,,
Saturated solution of chloride of lime...	2 drops
Hot water	16 ounces

When cold, filter, and it is ready for use.

George Thompson.—There are no definite data agreed upon as regards this point, but we may say that if the air tubes bear anything like the proportion to the box shown in your diagram, the flow of air will be far too slow for the plates to dry in a reasonable time. Four inches in diameter is none too much if the box is two feet square at the base. Thank you for the cutting, which is noticed elsewhere.

Wet-Plate.—Perhaps you use ammonia for dry plate or other work. The fumes of the alkali will cause wet plates to show the defects you describe.

Photographs Registered.

R. C. **Clifford** (Bradford)—3 Photos. of Miss Hannah Dale.
W. P. **Marsh** (Bognor)—2 Photos. of Police-Sergeant J. H. Barker.
John Smith (Stratford-on-Avon)—Photo. of Painting, "The Garrick Jubilee.,'
T. P. **Graham** (Bedford)—2 Photos. of Viscount Baring.

The Photographic News.

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For Advertisement Scale see page v.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI.—No. 1501.—June 10, 1887.

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10687

THE PROFESSED PHOTOGRAPHY IN NATURAL COLOURS.

Speaking last week of the circumstance that the Cellerier Syndicate distinctly did profess the production of "photographs in natural colours," we definitely and uncompromisingly said that the affair must be a great discovery if real, or a big swindle if the process should turn out to be merely a method of colouring photographs.

The witnessing of the method of production on Thursday was a poor fulfilment of the promise on the invitation. The demonstrator held in one hand a film transparency which may have been a carbon print, and in the other a card apparently coloured by hand. He laid the transparency over the card, and this was all. Such small demonstration was only made after much discussion as to whether we should be at liberty to publish that which was to be shown, and subsequently we were told we should see more if we would visit the works at Sidcup. We expressed our willingness to visit the works, and hope to receive an invitation. The process seems to be merely the placing of coloured materials or pigments at the back of a photograph, a thing which has been done so often by Woodbury, Vidal, and others before them. Colouring at the back has hitherto found its most popular expression in the "Crystoleum" pictures, which are still sold in Regent Street and elsewhere.

It is needless to tell photographers that the mere conjunction of colour *with* a photograph cannot in any sense be regarded as photography in natural colours, or, indeed, photography in colours; but perhaps any coloured photograph may be called a "photograph in colours" without straining the expression very much. The term photography in colours certainly indicates that the photographic process in some way determines the disposition of the colours. To the representatives of the concern we very distinctly represented the use of the head line, "Photography in Natural Colours," to be a very risky thing for them, and from what they said we hoped they would immediately withdraw this profession.

How far they have withdrawn their statement as to photography in colours we know not, but the following letter received on Tuesday last seems to indicate some idea of withdrawal. We shall be glad to hear from them that their claim is lowered to, let us say, "Photographs in Colours," a very different thing, as pointed out above, from "Photography in Colours."

CELLERIER'S SYNDICATE Ld.

16 *and* 17, *Poultry, London, E.C., June 7th*, 1887.

Dear Sir,

Cellerier's Syndicate.

In your issue of Saturday last you indirectly charge the Syndicate with having perpetrated a fraud on the public by pretending that their patents were to take photographs in natura colours by the lens or camera without the aid of colouring matter or other subsequent manipulation.

You and other editors were invited to witness the process of producing these photographs, and on reflection you must see that if there had been any wish or attempt to deceive the public the Syndicate would not have given you or any other person the opportunity of witnessing every detail of the process.

Again, the *British Journal of Photography* dated January 21 of this year, reports that at the Birkenhead Photographic Association "Mr. Lange exhibited a number of large highly glazed portraits coloured by the new mechanical process about to be brought out by Cellerier's Syndicate Limited, which were much admired, and pronounced a great improvement on the old hand-colouring methods."

The pamphlet given to each representative of the press also fully explained the processes in detail.

All the other papers who were represented at the exhibition gave the Syndicate credit for their candour in disclosing the method of their processes of reproduction of objects in exactly similar colours, and surely the word "natural" means nothing more or less than this.

If, however, the words "Photography in Natural Colours," which is a description adopted by most of the leading papers, is misleading or objectionable, then the Syndicate will be pleased to adopt another heading, as they have not the slightest wish for misconception or deception in any form. There is not, and never was, any secret. The representatives of the press were, and anyone are even now, invited to see the specimens at the studios, 58 Pall Mall, 16 and 17 Poultry, and 88 King's Road, Brighton, and learn for themselves how the photographs are produced.

As regards the envelopes in which the invitations were sent out, these were the property of the proprietor of the Pall Mall Gallery, who sent out the invitations. Sir Oswald Brierly had nothing whatever to do with the matter in question, and to say the least, it was not decent to mix up his name with anything connected with the Syndicate simply because a loan exhibition of his admirable works were at the time on view in part of the premises.

Trusting you will see the propriety of correcting the unfounded inuendoes in your next issue,—I am, dear Sir, yours faithfully,

E. W. Parkes, Managing Director.

The first paragraph of the letter does not represent what we said, the substance of our article being that it is a fraud to represent that a coloured photograph is a photograph in natural colours; we made no allusion to camera or lens, neither of which is essential to the production of a photograph.

As regards the second paragraph we—in company with two other representative of the photographic press, were only shown a mere ghost of the "Method of Production" after much hesitation, and this only after a discussion as to whether we were to be at liberty to publish an account.

The bearing on the case of the third paragraph we do not understand.

Perhaps the fourth paragraph refers to a pamphlet headed boldly *Photography in Natural Colours* which was put into our hands by a representative of the company on the 2nd instant. This pamphlet does not explain the process in detail, but a ray of information about corresponding to what we saw at the demonstration is practically lost in a mass of irrelevant matter; and, moreover, this information is given in the form of a quotation from the *Industrial Review*.

As regards the fifth paragraph, we may say that the writer states that which is incorrect.

The sixth paragraph leads us to hope that the Syndicate may do all future business under a title which need deceive no one. Should they adopt "Photographs in Colour," and also repudiate the old heading to their documents, we shall say no more on this score; and had such a heading been adopted from the first, we should have said naught as to mis-representation.

The paragraph referring to the envelopes is a little beside the main question, but we heartily agree with Mr. Parkes that it is scarcely decent of the Syndicate to mix up the name of Sir Oswald Brierly with the affair, even if the proprietor of the hall was legal owner of the material of the envelopes, and even if Sir Oswald's works were on view at the same place as the photographs of the Cellerier Company. As Sir Oswald Brierly has nothing to do with the Syndicate, an apology is certainly due to him from Mr. Parke's Company; and we are glad to have been the means of removing the impression that Sir Oswald was a mover in the Syndicate.

Having now to some extent cleared the ground on the question of what the Cellerier photographs are, and what they ought to be called, let us deal with them on their merits. We are pleased to be able to say that the average excellence of the photographs themselves is high, and the colouring is, on the whole, equal, and perhaps superior, to that of other collections of photographs coloured by analogous means. In some instances the work of colouring is really of high merit—indeed, nearly as good as the photographs tinted in water-colour which are sent out by the best photographers who employ good artists. There is certainly a prospect of the Syndicate doing a large and remunerative business, provided they can create a taste for their productions, and if they have at their command capital, energy, and skill enough to compete successfully with those photographers who are already established. The managing director, E. W. Parkes, is evidently a man of considerable talent, and many excellent examples of his own personal work with the camera are on view. He informs us that isochromatic plates are often used in making the negative, and our readers will appreciate the importance of this point when coloured material has to be put behind those parts of the transparency corresponding to yellow, orange, or red.

We hope next week to have a definite statement from the managing director that the objectionable heading has been expunged from all notices, and repudiated with as much publicity as circulated.

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SUB- OR PHOTO-CHLORIDE OF SILVER.

BY LYONEL CLARK.

Carey Lea's paper on these salts in your last issue is so replete with interest, that it will no doubt cause many similar researches to be made over here. The following few experiments which I made last autumn on the silver salts may therefore be of interest, if not of use, to some of our experimenters. I was at the time endeavouring to find out whether the black deposit of the image on bromide paper was metallic silver or no. I intended to have read a paper on this subject before the Camera Club, but I was compelled through business to be absent from England all the winter, and my experiments were therefore forcibly interrupted. Reading up the salts of silver generally, I of course came across the well-known statement that silver foil, when plunged into ferric chloride, is first reduced to the sub-chloride, and then to the chloride. Supposing the developed image on bromide paper to be formed of metallic silver, it followed that on treatment with ferric chloride, sub-bromide of silver and ferrous chloride should be formed. But I must first define what I mean by sub-chloride of silver. I understand a salt of silver which, like ordinary chloride, is white in colour, and dissolvable in hypo; but, unlike ordinary chloride, is reduced to a black or coloured state by the application of any ordinary developing agent, and is not dissolved by hypo. This is of course the state in which an ordinary dry plate is after exposure and before development.

I took a sheet of Eastman's bromide positive paper and exposed it behind a negative to gaslight, developed, and fixed it; after washing I treated it with a tincture of ferric chloride (the steel drops of the apothecary); being at the time in a country town this was the only form of the iron salt at my command. The black print bleached away entirely, leaving white paper with no trace of an image by gaslight. After washing, I tore the print in two, and placed one half in the hypo. It still remained colourless. Thoroughly washing this half, I placed it and the unfixed half in a weak ferrous oxalate developing solution. The fixed half showed no change whatever, whilst the unfixed half developed up clearly and brilliantly, in all respects exactly as though it was being developed for the first time, nor did it lose anything by a fresh immersion in hypo. I tried the same experiment on an Ilford plate with the same result.

The bleaching by ferric chloride, however, had been carried out in gaslight, and there was a possibility that the silver might have been reduced directly to a chloride, and then transformed by the gaslight into the sub-chloride. I therefore carried out the experiment again, keeping the plates, as much as possible, entirely dark, and never in any other than ruby light. The results were identical. It was at this stage that my departure to South America interrupted my experiments.

On reading Carey Lea's paper in your last number I hurriedly repeated my former experiments. This time, to avoid all mistake as to subsequent action of light, I did not fix the plate as before, but, immediately after development and washing, bleached the image with ferric chloride. It disappeared completely by ruby light, but on another plate by gaslight a faint, coppery-red image remained. This, however, disappeared completely in the hypo.

The original bleached plate developed up with ferrous oxalate clear and brilliant as before, exactly as if the plate had just been taken out of the double back. I bleached another developed plate in this way, which again showed a very faint red image, and exposed it unfixed to daylight. The plate was a Mawson and Swan's lantern plate. The image darkened considerably, assuming the foxy-red colour of gelatino-chloride prints, the white portion of the film assuming the greeny lilac colour peculiar to dry plates exposed to light. At the same time, I put out another similar but undeveloped plate under a negative in a printing frame. The image on this plate printed out dark blue or lilac, entirely different from the image on the bleached plate, showing that the two images were formed of different salts of silver. I intend, of course, to repeat and continue these experiments, and find out if ferric chloride forms sub- or photo-chloride of silver.

Carey Lea states that ferric chloride does not reduce metallic silver to chloride. If this is so, then the image on bromide paper is not metallic silver. Personally, I am inclined to believe in four stages:—(1) The unaltered white chloride before exposure. (2) After exposure, sub-chloride, also white. (3) On development, an unknown salt, reddish in colour, but dissolved by hypo, perhaps Lea's photo-chloride. Then (4) metallic silver, black and undissolved by hypo. I am inclined to believe in the existence of the unknown coloured salt from having often noticed the extraordinary weakening of the image in colour which sometimes so takes place during fixing, generally in under-exposed negatives; and I think still more generally when no bromide is used in the developer. I distinctly noticed one bromide enlargement which, being under-exposed, I fixed up without bromide, and which almost completely disappeared in fixing.

The whole subject of the salts of silver is so interesting that I hope some more capable experimenter will take it up and give us some fuller results than my slight chemical knowledge permits me to do, and it is with this idea that I publish these very incomplete and crude experiments.

PHOTOGRAPHY IN UNNATURAL COLOURS.

A CHAPTER FROM THE HISTORY OF THE PAST.

BY CHARLES E. PEARCE.

LOOKING over the pages of the Daguerrian Journal published in New York some thirty-seven years ago, I came across the first specimen on record of bamboozling in regard to "photography in natural colours." As the discovery of this photographic philosopher's stone has been made at regular intervals of about six months for the last twenty-five years and more, the history of the pioneer of what has lately been called the "scare in photography" may not be uninteresting, especially at the present moment.

The discoverer, L. L. Hill, of Westkill, is introduced in the early part of 1851, the editor of the journal in question remarking with much solemnity, "We are now called upon to notice the greatest and most valuable discovery that has been presented to the public since the announcement of the Daguerreotype by Daguerre." There are the usual speculations as the results of the stupendous discovery, and we are asked to "think but for a moment of a view five feet square. What must be the value of such a picture, in which all the 'colours of nature' are faithfully represented, and it is out of the reach of art to copy!" These editorial remarks are followed by a letter from L. L. Hill himself, wherein he states that in experimenting one day he "unexpectedly formed a singular compound," and with this he produced the "natural colours" on a metallic plate. He declares that he has "forty-five specimens, all of which present the several colours true to a tint, and with a degree of brilliancy never seen in the richest Daguerreotype," and adds, in the Pecksniffian vein which runs through all his communications, "I shall secure my right, if possible, by a *special patent*, and offer the process for sale on reasonable terms to all worthy Daguerreotypists. I have been offered 20,000 dollars for an interest of one-half; but whatever disposition I may make of it, it *shall not be monopolised.*' The italics are Mr. Hill's own.

Cheered by the magnificent generosity of the discoverer, the whole Daguerreotype world of America was in a hubbub, and awaited with intense eagerness for such crumbs of information as the "great Hill"—for so he came to be named—vouchsafed to drop. The editor of the journal quite lost his head, for without having seen a single specimen, he boldly announced in his next issue "the great question has fairly been solved, and 'natural colours' can be produced and rendered indelible upon the metallic plate." Hill's forty-five specimens had, in a month, increased to fifty-five, and he particularises views of a deep red house and snow-covered ground, and copies of highly coloured French prints far superior to the originals in brilliancy.

It is distressing to find, however, a fly in the ointment. Everything is going on swimmingly save in one point. The "Great Hill" cannot get his plates clean, and he promises to be very thankful to any person who would furnish him with valuable hints on this point, as he is convinced that "here lies one great cause of uncertainty." Notwithstanding, he asserts coolly that "the pictures by my process necessarily exceed in beauty the finest productions of the painter, they being drawn by light and painted by sunbeams."

A month later, and we find the editor visiting L. L. Hill in what he calls his "Mountain Home," and while there has a "Hillo-type" taken of himself which is "declared to be one of the best Hill had ever taken." It does not appear that the editor saw this picture "in natural colours," and from the nature of the termination of this curious history I should fancy it was highly probable he did not. He makes, however, a pathetic appeal to his readers to let Mr. Hill alone to pursue his experiments, and it may be presumed that the appeal was not without its effect, for it is June before anything more is heard of the experimenter. But in the meantime disagreeable, incredulous, persons—it is a shame such people should be allowed to exist—"have made statements which reflect seriously upon the integrity and motives of myself (*i.e.*, Hill) and friends." Hill, in the true spirit of Pecksniff, writes, "By means of certain legal processes of which I am not wholly ignorant, I could do these gentry more simple justice than by dignifying them in our Journal, yet I bear them no ill will." How touching! Still more is one impressed when the "Great Hill" adds, a little further on, "I have felt, from the first, that I am but an instrument in the hands of the Almighty, and one, therefore, bound in duty as well as by inclination to dispose of the secret in a way to accomplish the greatest amount of good." Pecksniff and Chadband rolled into one!

It will hardly be believed the great man's humility and confession that he was but an "instrument" had no effect upon his callous and captious critics. Such is the hard-heartedness and hard-headedness of some people, they *will* insist upon seeing before they believe. The "Great Hill" is evidently grieved by the ingratitude of a certain portion of the public. He writes, in July, "My true position is not generally understood: I am *alone*, and unaided by the facilities of a city." . . . "Again, modesty forbids my making many statements" (we can almost imagine him giving here a most significant wink). . . . "The very greatness of the discovery is, on account of my nervous temperament, one of my main hindrances." . . . "I am now so absolutely certain of overcoming every difficulty, that 100,000 dollars would not purchase my discovery *as it now stands*." How truly modest! Had his nervous temperament not stood in his way, he might have asked a million pounds instead of a paltry 100,000 dollars.

It is pretty clear, anyway, that the "Great Hill," despite his nervous temperament, had come to the conclusion the public would not stand Pecksniffian philosophy much longer, and he announces at the end of this epistle that he is having made about 100 "beautiful frames," and is thinking of exhibiting his pictures in his "mountain home" in the course of a few weeks—or months. While tantalising the anxious Daguerreotypists with the statement that he is not prepared to give a final announcement as to the precise manner in which the secret will be communicated, he is kind enough to promise that "all deserving persons shall be furnished on liberal terms."

Meanwhile he has been made co-editor of the journal, and his portrait is presented to the admiring readers by his faithful colleague, who, up to this point, certainly seems to have swallowed everything he was told. In July, pressure is put upon this gentleman, and he visits the "Great Hill" in his mountain home. Although Hill co-edited the journal, he had never been seen by his partner, "for although we were familiar with our pens, we never before had seen each other face to face." This is odd, because but a few months before, the editor was describing how he had sat to Hill for a portrait. Still, this invisibility may have been part of the process. It is delightful to be told that the editor found his partner "an intellectual, plain, unassuming, liberal-minded man," though it would have been much more to the purpose had he said something about the secret, on which subject he is discreetly silent, contenting himself with quoting Mr. Hill's request that "he may be left alone and undisturbed" until September, when the pictures will be presented to the public.

September comes and goes, and the "Great Hill" is presumably buried in the seclusion of his "mountain home," for nothing is heard of him. In October the senior editor suddenly wakes up, and, forgetting all the extravagant language he had used concerning Hill, announces calmly and without any warning that "from what we know we cannot see that Mr. H. has advanced a single step for the last six months. The specimens we have examined lead us to believe that Mr. H. finds it difficult to make the same 'singular compound' with which he claims to have taken his most flattering results." But this is not all. The Editor proceeds to describe the specimens; which, he says, were taken from prints without the aid of the camera. His description is too long to quote. He likened the effect to that produced by some species of enamelling. His language is decidedly the reverse of enthusiastic, and it is pretty clear he does not think that the colours, such as they were, were produced by light. In announcing that the co-editorship has been dissolved, the senior Editor rises almost to severity. "We feel," he says, "that the Daguerreotypists have remained patient in waiting upon Mr. H., and that they have now a right to expect him to exhibit his best results. We cannot understand why his 'sacred obligations' (Hill had been putting on his Pecksniff stop again, it is certain) restrain him from exhibiting his best, and allows him to show his 'every-day experiments'"—the excuse put forward by this precious discoverer why the specimens he showed were so bad.

Hill is Pecksniff to the last. In his notice to the readers announcing his resignation he has the impudence to say he feared "that giving publicity to my progress in the natural colours would injure the business of my Daguerrian brethren!" But enough of the "Great Hill" and his bombast, his offensive patronage, his affected humility, and his falsehoods. He and his "singular compound" have disappeared, and photographers, at any rate, are not likely to be deluded by any of his successors.

FRENCH CORRESPONDENCE.

ASTRONOMICAL CONFERENCE—ENAMELLED PRINTS ON EASTMAN PAPER—SWISS SOCIETY OF PHOTOGRAPHERS.

Astronomical Conference for the Photographing of the Heavens.—We have had occasion to speak of this congress whilst it still existed merely as a project. It has now taken place, and we know exactly what has been done therein, and are in a position to sum up the interesting work which has been accomplished. The question which concerns us the most is that relative to the application, strictly speaking, of photography to this astronomical work. From this point of view we have been struck with the surprising fact that the number of members of the congress thoroughly competent in photographic work was most limited. We could not refrain from expressing this sentiment in the proper quarter, and received the following singular reply, "*There are too many Frenchmen.*" France, in fact, was not represented by anyone in the purely photographic department. We cannot consider as photographic *savants* comparable to Messieurs Abney, Eder, Vogel, and Janssen, for instance, Messieurs Henry Brothers, Cornu, &c., but these gentlemen were those among the French delegates who were most conversant with photographic questions. It is true that in these preparatory meetings no definitive decision has been taken, and that difficulties have only been attacked by a general order. A permanent commission has received instructions to study the points of detail before the work is undertaken, and this will take yet a considerable time. This commission has been composed exclusively of members of the Congress, but it is to be hoped that wherever it has representatives it will seek the aid of specially competent persons, without which the interesting work of the photographing of the heavens will produce no solid result. The photographs obtained from different parts of the globe will not be comparable with each other, and nothing of sufficient use will result from this Babel-like confusion. In the meantime the following are the principal decisions arrived at. The instrument to be employed is to be a refractor of 33 centimetres in diameter, and 3 meters 43 cent. focal length. The sensitive plates are left to the choice of the operators. No conditions are imposed as to receiving them all from one source. This decision will, in our opinion, produce serious mischief, on account of the very probable dissimilarity of the results. As to the question relating to the employment of isochromatic plates, it has, in consequence of a proposition of our eminent *confrère*, Prof. Eder, supported by some of his colleagues, been given over to the consideration of the permanent commission. Mr. Hasselberg has exhibited two photographs of the sky taken from the same point and showing different results, one upon an ordinary and one upon an isochromatic plate. This certainly proves the importance of this particular point, which, it is to be regretted, was so much neglected at the congress, under the insufficient pretext, put forward by some of its members, that all the stars emit white light. Not only ought isochromatic plates to be used, but it is further necessary to distinguish between the different kinds among these plates, and to employ only one kind, for different effects might be obtained from the use of different optical sensitizers. We may be permitted to hope that the commission charged with the study of these questions of detail will recognise the utility of films sensitive to the greatest length of the spectrum. This commission is charged to decide by experiment those questions upon which the members of the congress did not consider themselves sufficiently enlightened. This is certainly the wisest of the decisions arrived at, considering that the whole thing is so new. An undertaking so considerable should not be undertaken without such pre-arrangement as to bring into perfect accord the numerous and delicate points raised by a work of this kind executed in common at all points of the globe. The process of photographic science is so rapid, that it may well be that the decisions of the permanent commission will be continually modified as new improvements are introduced. It may result from this that the commencement of the common enterprise will be indefinitely adjourned, for it would be truly childish to commence the work if it had shortly to be begun over again, and such might be the immediate consequence if, for instance, a material was discovered of such sensitiveness as to make it possible to reproduce stars of the 26th or 30th magnitude. Why in such a case should we be limited to those of the 14th magnitude? In any case we rejoice over the importance given to photography by applications of this kind; it must gain in public esteem, and better merit the support and favour of public administrations, which will always show themselves more disposed to support that which has for its object instruction in science. Until a fresh step is made, this will be the first and most considerable benefit resulting from the astronomical reunion.

Enamelled Prints on Eastman Paper.—This process, of which we claim the paternity, was presented by us at the last meeting in May of the French Photographic Society. We were careful to say that such efforts were certainly not among the number of those which contribute to what may be strictly called photographic progress, but that it concerned a method of improving the appearance of the proofs—those especially which, in the mat condition, have an incomplete effect, such as exists in impressions upon Eastman paper and in platinum prints, particularly when of small size. It has been recommended to dry these images upon a sheet of ebonite or of glass, polished and rubbed with talc. The enamelled image takes the polish of its support; but this polish covers the whole paper, the image as well as the margin, supposing that we have, with the help of a mask, obtained a white margin. In place of employing a glass polished on its entire surface, we use plates having ground surface round the edges in such a way that the central part, corresponding to the surface of the image, is left bright. It results, from this arrangement, that if an image on gelatine paper is dried upon this glass, and care is taken to make the polished space coincide with the image, we shall have after desiccation a sheet of paper presenting two different aspects; the image only will be enamelled, whilst the margins will be mat. If, in place of limiting ourselves to margins evenly mat, we grind upon the glass a pattern to serve as framing, the pattern thus engraved will be reproduced upon the white margin, and the print is very well displayed, especially if the pattern is of elegant and graceful design. We may even obtain margins in intaglio or in relief by cutting the glass in such a way as to produce this effect. In the latter case, we cannot content ourselves by simply laying the print upon the talced glass, the film of gelatine upon the paper not being thick enough to fit into the hollows. We must in this case supplement the paper by the preliminary employment of a sheet of gelatine which has been thoroughly swelled with water, and which is applied to the engraved glass. This sheet, thoroughly softened by soaking in water, takes into the depressions of the glass. The proof may be laid in its place as soon as the sheet of gelatine adheres sufficiently to the surface of the glass. The whole is left to dry in a place free from currents of air, and when it is dry, the proof, which makes one body with the gelatine, is found to have its framework in hollow and relief, according to the form of the support employed. If we have recourse to the process of pigment printing, it is easy to produce variations having charming effect. We may, for instance, transfer upon the polished centre of the engraved glass a print developed upon flexible support. If it is desired that the image be coloured, the colour must be applied upon the image after it has been transferred to the glass. The whole is then coated with plain collodion. The manner of drying enamelled images has much to do with the success of the operations which have just been described. If the process of drying is too rapid, the paper becomes spontaneously detached at the edges, whilst the central portion of the proof still adheres to the glass. This causes deformations, which may be avoided by covering the back of the image and the whole surface of the glass with a sheet of ordinary paper previously wetted. This paper must be larger than the glass, so that its edges may be brought round to the other side of the glass, and there cemented to it. In drying, the paper contracts strongly, and thus keeps the proof flat against the engraved glass. Thanks to this little contrivance, the accident of curling away from the glass is no longer to be feared. It is not necessary to say that such means cannot be employed on sheets of gelatine not backed up with paper. We must then limit ourselves to keeping the edges in place by the help of a border of albumenized or gummed paper applied as a binding round the edge of the plate. Perhaps there may seem to be too many details for such a small matter, but when operative applications are in question we know that we ought not to omit useful details, as by including them, persons desirous of repeating our experiments will succeed with greater certainty. One last word is necessary to finish this subject; it relates to prints not incorporated in gelatine, such as platinotypes and phototypes. To enamel prints of these kinds we must in the first instance gelatinise them with a solution of gelatine in water at five per cent. Afterwards the print is treated in the manner which has been described for prints upon Eastman paper and the like.

Swiss Society of Photographers.—This Association, which already counts more than fifty members, constitutes a sort of syndical chamber, similar to that which in Paris renders such great services to the photographic profession. It has just settled the points of a regulation concerning the apprenticeship of young people desirous of embracing photography as a profession. It would take too long to reproduce here this regulation in full. We will restrict ourselves to giving the last article, which well sums up the object kept in view. It enjoins upon all the members of the association not to engage any assistant who is not in possession of a diploma, or who, having been apprenticed to another photographer, left him unhandsomely, and without due cause, before the end of his apprenticeship. This is an excellent example, which may be recommended to all photographers of other countries.

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PYROGALLIC ACID, AND ITS USES IN PHOTOGRAPHY.

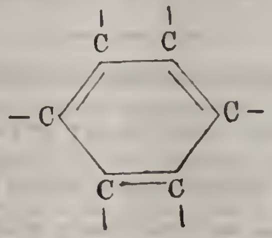
BY DR. THOMAS W. DRINKWATER.*

The first point that strikes me is the misnomer "pyrogallic acid," for what we know as pyrogallic acid is not an acid, but an alcohol. Some time ago, reading a short article on development in one of the Year-Books, I was amused to find how the writer strongly insisted on the acid nature of pyro. He was trying to prove that all our development was really acid development—that no matter how much alkali we used, we also had to use an excess of acid before it would act, the acid being either citric, sulphurous, or (save the mark!) pyrogallic.

Without stopping to consider the rather novel views on development enunciated by this writer, I must say that it is a *reductio ad absurdum* proof, seeing that the argument is really based on pyro being a body, and having the properties of an acid, whilst in reality it is of no such nature. Pyrogallol, as it should be more correctly termed, belongs to the same group of organic compounds as carbolic acid—also misnamed, by-the-bye. They are both alcohols derived from benzine or benzol.

C_6H_6.	C_6H_5 OH.	C_6H_3, 3OH	C_6H_4 2OH.
Benzene.	Carbolic Acid.	Pyrogallic Acid.	Hydroquinone.

Scientific chemists are fond of speculating as to the arrangements of atoms composing the group, and in the benzine series we have every reason to suppose atoms are arranged and connected one with another in such a way that each earlier atom has the same relation to the other. The graphic method adopted to show this is this:—



Now it is possible, assuming our theories to be correct, to prophesy how many bodies can be produced having the same formulæ, and these prophecies stand more chance of being fulfilled than those of a sporting prophet on the Derby.

These theories have been proved to be correct, and many new bodies have been discovered, in consequence, which might otherwise have escaped notice. Such bodies are described in chemical language as isomeric. Theoretically, as regards pyrogallol, we find there should be really three bodies having the formula C_6H_3, 3OH. All these three bodies have been isolated, and, in appearance, closely resemble one another. I think here is a field for experiment and research opened up. How could these bodies act as developers?

I have broken the ice a little myself, but not with any satisfactory results as yet; chiefly because, owing to *flitting*, like many others at this season, my dark-room is not, I am afraid, quite light-tight as yet, and as my experiments ended, not in smoke, but in fog, I am at a loss whether to attribute it to developer, light, or a combination of either—combined, of course, with the uncertainty of working always connected with new developers.

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* Notes of remarks made before the Edinburgh Photographic Society.

As regards the names of these others, the pyro, pyrogallol, phloroglucinol, hydroxyquinol, I may say they all act as developers; that is, they are reducing agents.

During the time I have practised photography, pyrogallic acid has undergone two transformations—one in form, and the other in price. As a schoolboy I amused myself and tortured my friends with photography, and I well remember having to save out of two week's pocket-money whenever I wanted to indulge in pyro. If I remember aright, I paid sixpence for about 30 grains. After leaving school I gave up the art, for I neither had time, nor could I carry the enormous amount of paraphernalia about with me when a student. A few years ago, however, I could not refrain from returning to the old love, and commenced by reading up the elements of modern dry plate photography. I must admit that when I found my old bugbear pyro was the favourite developer I thought of the expense, but soon discovered that what I formerly bought by the grain I could now purchase by the ounce without any considerable fortune to back up the expenditure. I enjoyed the luxury of purchasing a whole ounce of pyro, and then found that along with a transformation of price there was one in form. What I purchased as a boy was more compact and less feathery than what we are now familiar with. Formerly I knew it was made by heating gallic acid (hence, in fact, the name) until it lost carbolic acid. Considering the price at which it is now sold I cannot believe that it is made in this way in the present day. I have made some enquiries as to the German method by which pyro is made, but cannot procure any definite or reliable information; the process seems to be very much a secret. There are a number of ways of making it artificially, but only one, to my mind, would account for the cheapness of the present day article. As thus—

$$C_6H_3OH\ Cl\ KSO_3+2KOH = C_6H_5\ 3OH+KCl+K_2SO_3$$

Whether this is the method adopted I cannot say; but of one thing I am certain, that it is not made from gallic acid.

All bodies allied to carbolic acid—or the phenols, as they are termed—have the power of absorbing oxygen to varying extents. Phenol turns red on exposure to air; pyro turns brown. In chemical language, they are reducing agents, some more powerful than others. Now what we call development consists in reducing the salts of silver to the metallic state after they have undergone some change by light; what that change is I do not think any of us can say. The latent image is at present an unexplained mystery. That the change is wholly chemical I do not believe. Be that as it may, a reducing agent applied to an exposed plate has the power of reducing to the metallic state those portions of the silver salt which have received the actinic rays. Used by itself it acts with great slowness, but in presence of an alkali which absorbs the halogen set free, the action is rapid.

In the chemical laboratory, we use pyro to absorb oxygen in gas analysis, always in alkaline solution.

As you all know, the question of which alkali to use is a somewhat vexed one. Chemically speaking, I cannot see that it matters which alkali is taken; the final result is much the same, although the one developer may produce that result quicker than another.

We are all apt to overlook the fact that a process that succeeds with one man will not do with another. I should say, let each one use the alkali which suits him best, and with which he gets the best results.

As to the unhealthiness of ammonia I am doubtful. The small quantity given off during development I cannot bring myself to believe is hurtful, notwithstanding all that is said to the contrary. I am acquainted with chemical works in which ammonia fumes are constantly present, and in which the workmen are healthy enough. In my own laboratory I have frequently had more ammonia flying about than ever I had in my dark room.

My experience in the matter may not be of much value, but I have tried all the three alkalies, and can develop equally well with either. Soda alone, however, with me, gives a red tone which is rather misleading when judging of printing value.

One thing I never do—that is, keep pyro in solution. To my chemical mind it is impossible to keep it in solution for many seconds without change taking place. When the brown colour is developed after absorbing oxygen, a number of complex bodies are present, including acetic acid, carbolic acid, &c. Both of these bodies act as restrainers, besides destroying a large quantity of alkali. In fact, the sulphurous acid is the most powerful restrainer I know of. I have saved over-exposed plates with a solution of sodium sulphite saturated with sulphurous acid gas, when I do not think I could have done anything with bromide. But sulphurous acid is as unstable a body as pyro. It tends to become sulphuric, or the sulphite to sulphate, and after that stage the solution is useless. I always use pyro dry, and nothing will ever make me change except the introduction of an hitherto unknown preservative. For professional photographers using large quantities of pyro it may not matter so much, but to my fellow amateurs I advise that they should avoid solutions of pyro.

Now a word or two as to the other compounds alluded to in the earlier part of my paper.

Phloroglucinol—I procured a small quantity from a benzene compound, and attempted to use it as a developer. It began to develop a picture without any alkali, but almost immediately fog appeared. You could not use ammonia with this body without it undergoing change, but the new substance produced will act as a developer. In my only experiment fog was produced at once; this proves that it has the power, and I have no doubt careful experiment would show us a method by which it might be used.

Hydroxyquinol, the other body referred to, I have not had time to make, but I should say that it was even more powerful than either of the other two forms.

Now, I will ask you to observe one thing viz., the close relationship between these bodies:—

C_6H_6 $C_6H_5\ OH$ $C_6H_4\ 2OH$=Hydrokinone or Quinol
Benzene. Carbolic Acid.
$C_6H_4\ 2OH$ Catechol
found in the autumn leaves of the virginia creeper.
$C_6H_3,\ 3OH$ Pyrogallol
$C_6H_3,\ 3OH$ Phloroglucinol
$C_6H_3,\ 3OH$ Hydroxylquinol

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CARBON PRINTING: EXPLICIT INSTRUCTIONS FOR PROFESSIONAL AND AMATEUR PHOTOGRAPHERS.

BY MAX BOLTE.*

Drying Box.—For those who cannot arrange a special room (well ventilated, dry, and not in too close proximity to a kitchen, stable, &c., as mentioned already), a contrivance like this will enable them to take up this fine process. A somewhat detailed description and illustration are necessary (see Fig. 4). The box, *A A A A*, should have the following dimensions: Length, 3 to $3\frac{1}{2}$ feet; breadth, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet; height, $2\frac{1}{4}$ to $2\frac{1}{2}$ feet. The boards ought to be one inch in thickness, well joined, and, of course, perfectly light-tight. A door must be provided opening the whole length, and fitting perfectly light-tight also. At one end of the case, as near as possible to the top, make an opening, O^3, say $\frac{3}{4}$ inch by 2 feet, parallel with the top, and place before it a light-trap, *B*, as indicated in fig. 4. This trap can easily be made by any one who possesses a pocket-knife, some nails, and a glue-pot. The arrow in the drawing indicates the course of the air (passing through openings O^1, O^2 and O^3, which are all three of same length and breadth), and the black spots show where the openings should be made. There must be provided a board on which the zinc tray *C* can rest, which must be filled with chloride of lime. A door must also be made by which this tray may be introduced and withdrawn, of course also light-tight. As the tray is rather long, it will be best to make the door at the smaller end of the light-trap and at its front. Also make a hole, O^4, opposite and diagonally across from the former, *i.e.*, at or near the bottom of the case, *A A A A*. This hole should be round, and of 3 inches diameter. Attach to it the chimney tube *D*. This tube must have an elbow and a perforation at the height of the top of the case or above, for the introduction of the gas-burner. If no gas can be obtained, the tube should be provided with a drum or a cone, and in it should be placed a kerosene lamp, resting on a cross-bar at about one inch from the bottom of the drum. The area of the tube should exceed that of the opening O^3, coming from the light trap B, in order to produce a stronger draught. There should be placed a light trap, E, before this outlet of the air, in order to prevent any light rays proceeding from the burner in the chimney entering the case. It is sufficient to join two small boards of say 10 by 4 by $\frac{1}{8}$ inches lengthwise together, and place them before the opening inside of the case. Now extend some copper wires parallel with the front side of the case and at about three inches from the top, from one side to the other, and make them equi-distant from each other. For a box of the above dimensions four or five wires will be all that is required, and will allow of hanging upon them from sixteen to twenty pieces of carbon tissue of 8 by 10 or larger, and this quantity is sufficient for one day's work. It will dry in a corresponding time, if properly managed.

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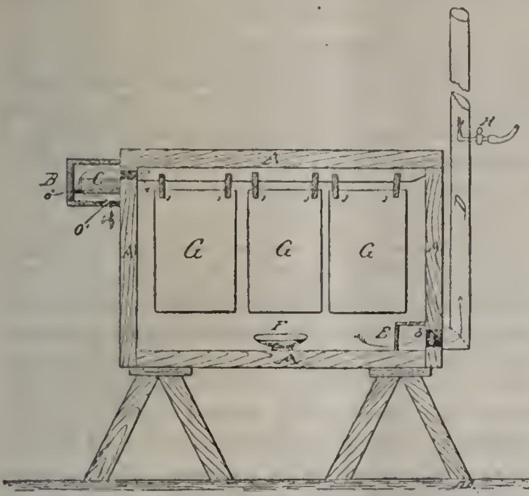
* Continued from page 294.



A A A A, drying-box; B, light-trap; C, chlor. of lime tray; D, chimney; E, light-trap; F, calbium cup; G G G, carbon paper; J J J, clips; H, gasburner; O^1 O^3 O^3 O^4. openings.

The drying box should rest on trestles eighteen inches high, as indicated in the drawing. The joints of the boards should be pasted over on the interior of the case with some stout paper strips, and the front door must of course swing outward. It is good to provide the rabbets of the door frame with some cloth strips, in order to exclude any dust or light which, without this precaution, might find its way into the interior of the case. The whole contrivance ought to be kept as clean and dry as possible. It is a good plan to place some heated bricks in the box from time to time, and allow them to cool off. This should be done when the weather is damp, and of course by preference before the case is to be used. In the course of this treatise we shall give some more explicit instructions for the management of the drying box.

The above-mentioned accessories, with the exception of the photometer, of which a description and illustration will be furnished later, are the requisites necessary. As regards scales, measures, weights, filtering and blotting-papers, &c., these are generally at hand with any photographer or amateur.

Chemicals.—There are two chemicals which play an important *role* in this process: bichromate of potash ($K_2Cr_2O_7$) and bichromate of ammonia $(NH_4)_2\ Cr_2O_7$; but as there is such an extraordinary difference of price between the former and latter, without any equivalent benefit, we shall only speak of bichromate of potash. This chemical should always be handled with the greatest care, for it is strongly corrosive. Solutions of this salt taken internally cause violent inflammation of the stomach and kidneys, accompanied by severe vomiting (yellow) and diarrhœa. Bicarbonate of soda or magnesia should be taken as soon as possible. There is not much danger, since cases where mistake has led to the taking of these solutions internally are exceedingly rare. By far the greater danger lies in the handling of the cold or warm solutions in which the carbon printer might have to immerse his fingers and hands. It should always be borne in mind that these solutions, even if employed weak and tepid or cold, cause strong irritation of the skin, and should there be any light scratches or lesions of the skin on the fingers or hands, the inevitable consequence will be an irritation of those wounds, with sometimes very disagreeable consequences and rather difficult healing. We strongly recommend not to allow the fingers and hands to remain too long in the solutions. Rubber gloves should be used. The cold sensitising baths, although stronger in bichromate, are not as dangerous as the warm, or sometimes even hot, developing bath, for as the pores of the skin open by warmth, they are more likely to absorb the poison contained in these solutions. Avoid also contact of the eyes or nostrils with the fingers which have recently touched chromic salts.

Some months after having taken up carbon printing, I was surprised to find myself with rather disagreeable sores and ulcers, which made their appearance on my fingers and hands, and I attributed them to impurity of my blood. The physician whom I consulted admitted that he had never before seen such ulcers. Business occupations compelled me to suspend carbon printing for about two months, and the ulcers had by that time disappeared. When I again took up carbon printing, having some slight scratches on the hands which I got by playing with a cat, I noticed that they would not heal, showing much inflammation, closing at the surface and forming pus. Some dreadful ulcers appearing in much greater numbers also made their appearance, and this time they were of a far more venomous character, and for weeks resisted any treatment. I decided to go to Germany, and there I consulted three eminent physicians. Two of them, after careful examination, came to the conclusion that my case was analagous to syphilitic disorganization. Subcutaneous injections of bichloride of mercury with a slight addition of common salt were made. One of these injections provoked an ulcer on the hip which kept me for eleven weeks in bed. Three operations were made, cutting always the borders larger, and employing chloride of zinc for seventy-two hours to cauterize the bad flesh, &c. Visiting New York about a yea after this experience, I learned here that the disease from which I was suffering was nothing else but bichromate of potash poisoning. The remedies given to me were sulphide of calcium (two pills of an eighth of a grain daily for one week) and phenic acid in syrup (a tablespoonful morning and evening, also for one week), and alternating these two for about six to ten months. This was in 1884, and to-day I am assured that this treatment has entirely cured me, and for more than eighteen months I have been well.

Waxing Solution.—To prepare this solution, take

White (virgin) wax	1 ounce
Benzole	100 ounces

The wax must be scraped as fine as possible. Introduce it into a bottle, pour on the benzole, and shake well until entirely dissolved. Let it stand for a couple of hours, and decant the clear solution. Be sure that the bottles are absolutely clean and free from water, for the least drop would render the solution turbid. Only pure white (or, still better, yellow wax, which is generally purer) must be used, for if tallow is contained in it the solution will not give the high gloss desired. If adulterated wax has been employed, an addition of one part of resin to ten parts of wax may be used.

Collodion.—The collodion should not contain more than one per cent. of cotton, and equal parts of alcohol and ether—*i. e.*, 50 parts alcohol, and 50 parts ether. For those who do not know how to prepare the collodion, I will here give a convenient method. Having weighed the right quantity, open the soluble cotton, and tuft it well; introduce it into a bottle somewhat larger than required, and pour on some of the alcohol. Shake well, add the remainder of the alcohol, and again shake well until you see that the cotton is perfectly soaked. Now add a small quantity of the ether and shake well; add more and shake again, and so on until all the ether has been added. Allow the collodion to stand for a couple of days, for new collodion does not work so well as old. It may be used as it is, however, if desired; or, if necessary, a slight addition of carmine or aniline red may be used. These colours are first dissolved in alcohol, and of this solution the necessary quantity is added to the collodion, which after this addition is again well shaken. The collodion should either be decanted, or, better still, filtered through flannel, in order to have it as clear as possible.

Alum Solution.—This is used—and cannot be dispensed with—after the development of the carbon picture, as it serves to harden the gelatine and eliminate any trace of bichromate of potash which might still be contained therein. For double transfer pictures the solution must not be stronger than 2 to 100; for single transfer it can be made as strong as 5 per cent. It is preferable to use rain water, though any water can be used; but then from three to five drops of sulphuric acid must be added in order to keep the solution clear. Before use filter repeatedly, at least three times. It is best to use always fresh solution.

(*To be continued.*

Notes.

That the phemomena of lightning may be much elucidated by photography there can be but little doubt, provided that the conditions under which the photographs are taken be properly noted. We are therefore pleased to find that the Royal Meteorlogical Society is making efforts to secure those photographs which have been taken, also to encourage the production of photographs under known conditions; and some communications from the Secretary will be found on page 366.

Perhaps the Society does not sufficiently insist on the registration of the conditions under which the photographs are taken, as in its circular it merely says:—"If a rapid plate and an ordinary rapid doublet with full aperture be left uncovered at night during a thunderstorm for a short time, flashes of lightning will, after development, be found in some cases to have impressed themselves upon the plate. The only difficulty is the uncertainty whether any particular flash will happen to have been in the field of view."

In order that the probability of usefulness may be increased, some points should be noted, the following being important. First, the exact position of the camera. In many countries ordnance maps can be obtained on such a scale that a minute dot will indicate the position of the camera within a foot or two, and it will often be easy to record the position of the apparatus with far greater exactness, as, for example, when the camera is placed at a window. A thread with a plummet should be allowed to range from the optical centre (say the diaphragm in case of a doublet) to the floor, where a mark should be made. Second, the time at which the exposure was made. Third, the aspect of the camera. When the locality is exactly recorded, this datum may be approximate, as there will generally be the means of exactly determining it upon the plate itself. Fourth, the equivalent focus of the lens, but the determination of this may well be left until it is found that something valuable may be deduced from the photograph. Fifth the distance of the flash. The recording of this is a very important matter, as when the focus of the lens is known, it will be easy to determine the actual distance between cloud and earth, also the horizontal angle subtended to the observer at the camera. To determine the distance, the observer should note as accurately as possible the time elapsing between the flash and the report, and in doing this, even such a chronograph watch as may now be had for five or six pounds will be found of great service.

Suggestions of our readers as to this matter are requested, and may be forwarded to us or to the Secretary of the Royal Meteorological Society.

According to the latest regulations, a duty of thirty francs for one hundred kilogrammes is to be paid on dry plates taken into Switzerland, and this will amount to a few pence on each dozen whole plates. Even should the Custom Officers be punctilious, and insist on charging for plates intended for personal use, the burden on the tourist will not be heavy.

Two very fine photographs of stage scenes, taken by Falk of New York, have been kindly forwarded to us by A. H. Elliott, the editor of *Anthony's Bulletin.* They measure 18 by 9 inches, and are scenes from Denman Thompson's "Old Homestead," at the 14th Street theatre. The electric light was used.

A remark made by Mr. Justice Butt during the hearing of the Holloway will case is rather suggestive. One witness said that the late Thomas Holloway suffered from nervousness, whereupon the judge remarked, "Have you seen his photograph? If you look at it, you will find that the artist has failed to catch the characteristic." Mr. Iuderwick then observed, "It was not, perhaps, taken at the proper moment." It is difficult to understand precisely what this little piece of dialogue means; but we presume that a photograph of the deceased had been put in for the purpose of showing that he was a man likely to be susceptible to "undue influence," which was the matter sought to be proved. If so, very little use seems to have been made of it, for the conversation quoted above is the only reference to the photograph throughout the trial, and its fragmentary nature is extremely tantalising. But it seems to indicate the introduction of a new form of evidence in disputed will cases. The jury at present have only what the witnesses say to go upon, and it may be thought their judgment will be helped by a sight of the portrait of the person who is supposed to be of unsound intellect. And here the suggestiveness of the judge's remarks comes in. The late Mr. Holloway's photograph showed no signs of nervousness; but, supposing the camera had been on a vibrating stand at the time, would not the deceased gentleman have appeared in a highly shaky condition? The moral is, that too much dependance must not be placed upon photographic evidence.

Photography is now used to illustrate Parliamentary papers, the report of the Master of the Mint, just issued, containing an exceptionally good Collotype plate, executed by the Autotype Company, and illustrating the new coins, the Jubilee medal, and also showing the reverse of a George noble of Henry VIII. In making photographs of coins and medals it is not usual to photograph the coin, but to photograph a plaster cast of the object, the plaster being generally tinted with a small quantity of dark pigment.

The Jubilee medal is certainly a fine work of art; the Queen's head being from a design by Boehm, and the symbolical reverse by the President of the Royal Academy. The price of the report (90 pages) with the collotype plate is nine-pence, or tenpence half-penny post free; and it can be obtained at the Parliamentary Paper Office, East Harding Street, London, E.C.

It may at first sight appear that in France, and on the Continent generally, the laws are more protective of the public against the misrepresentations of commercialists than in this country. Some few years since, it may be remembered that a French photographer came over here, and set up his studio where, in addition to the portrait of the sitter, he supplied a suppositious spiritual visitor duly arrayed in the recognised ghostly style. There was no interference of the authorities, and, judging by Carlyle's standard of the number of the credulous, he must have pocketed a respectable amount during the visit with which he favoured this country. He returned to France, however, and after carrying on the same lucrative practice for a short time there, the police broke it up by making a sudden raid upon his premises, where they captured the draperies, properties, negatives, &c., with which the photographer had been producing his "spiritual" pictures.

But, looking at recent interferences of our courts of justice with the absolute freedom of the commercialist, one may doubt whether, since the memorable Belt case, the trader who misrepresents has a better time here than in France or Germany. Not long ago, the conspiring vendors of a piano were convicted because they falsely represented that the piano cost them more than they actually paid for it, and this in spite of the fact that they sold the instrument for a more reasonable price than would have been charged in many retail shops. The mere conspiring to make a false pretence for influencing a sale was held to be criminal. Again, two recent cases will be remembered in which company promoters who had been unguarded in the wording of the circular—had to refund; one of them relating to a sewing machine, and the other to a petroleum motor. Perhaps a rather more severe case was that in which a man was imprisoned for offering in pawn a gold ring which had been weighted with lead; it not appearing on the depositions that he was an expert acting in the ordinary course of his business. These and numerous other recent cases seem to indicate a tendency towards raising the standard of commercial morality in England.

Some thirty years ago, when taste in domestic decoration was at its lowest point in England, an exhibition was held at Marlborough House, at which were shown ordinary samples of carpets, hearthrugs, crockery, wall-papers, &c., for the purpose of pointing out how false and ugly in every way was the so-called art of the day. The exhibition was a veritable room of horrors, but did an enormous amount of good. It would not be a bad thing if a permanent photographic exhibition were established on similar lines. Examples of what to avoid in posing, retouching, mounting, and framing, should alone be admitted, and medals should be offered for the most instructive examples.

The effects of the collision between the Atlantic liners *Celtic* and *Brittannic* is well shown by some striking photographs sent to us by F. C. Beach. Referring to this matter, he says:—"These pictures were made in about half to one second's exposure, with a Morrison's wide angle lens $\frac{f}{48}$, on the morning of Monday, the 23rd of May, the next day after the *Celtic* was secured to her dock. No. 1 shows the best general view, the wavy nature of the break due to the up and down motion of the waves while she was in collision with the *Brittannic*, and illustrates how the bow was bent around on itself. The stem is split and held up by a chain. The opening was big enough to accommodate a small-sized horse and carriage, and you will observe the crowd of men peering out of it at the photographer. No. 2 is a bow view, and gives a better idea of the width of the opening. No. 3 shows a view looking towards the bow, giving the end of the stern, showing how completely it was twisted around. The *Britannic* was not injured as badly. The *Celtic* is in the dry dock being repaired, and will be ready June 22, they expect."

It is a common remark that instantaneous pictures very often fail to convey the idea of motion, although we know very well from the nature of the subject that the object must have been moving at the time it was photographed. Dr. Eugen Dreher, in *Die Natur*, has some very pertinent remarks on this point in an article on "The Appearance and Reality in Pictures." Dr. Dreher maintains that "it is clearly impossible for an artist to give the exact appearance of motion. He can only seize a given instant or stage, and so manage that it shall represent itself as the effect of the preceding stage and the cause of the following one. A sword-blow must be represented at a decisive point, not at a stage in the descent of the weapon, else the illusion will be destroyed; a pendulum in motion, not at the bottom of its course, where it would seem to be at rest. In painting a galloping horse, no stage of the exact motion is reproduced. The instantaneous photographs have demonstrated that; and also if the artist should attempt a reproduction of the kind he would give any but the effect desired." Some ardent enthusiasts would have the artist paint a horse as Muybridge has photographed it, but this most certainly would be wrong, for the artist can only paint what the eye sees, and we suppose no photographer would seriously maintain that the eye can, in a hundredth part of a second, pick one particular movement out of a succession. The instantaneous photographer, to be thoroughly successful, must do as the artist does—select a point which will suggest motion.

It was a happy idea to hang upon the walls of the room where the banquet in connection with the proposed canal to connect the Baltic and North seas was held, large photographs of several old and picturesque houses, which have had to be pulled down to make way for the harbour improvement works at Kiel. Our ruthless contractors would never be guilty of such an act of consideration. Old mansions are constantly being removed, and their sites utilised for jerry-built houses. It is a thousand pities that some memento cannot be preserved. If the Government of London were in the hands of broad-minded, educated men, instead of what is known as the "well-to-do tradesmen," this would be done systematically, and there would be some public institution in each parish where such interesting memories of the past might be stored.

It is quite time the *Pall Mall* started some of their innumerable representatives with cameras. One correspondent gave a very graphic description of the Bodyke evictions ; but if he could only have taken half-a-dozen photographs of the scene—the pouring down of the scalding water on the besiegers, the defence of the roof, the escape of the bees, and the other exciting incidents—the exhibition of the pictures would do more than all the speeches and meetings in the world. The gallant attack on Monday by a constable under the shelter of an umbrella lent him by Colonel Turner would have made a most effective picture.

Without photography the matrimonial papers would hardly exist. The preliminary negotiation is always carried on through the medium of the photographs of the parties. One of these marriage organs contains the notice : "Photographs will be sent for inspection on the distinct understanding that they will be returned within 24 hours." How much must depend upon that inspection, and what a responsibility rests upon the photographer ! An unfavourable expression, an under-exposed negative, a badly-lighted face, may cost a lady a husband, a gentleman a wife. Why doesn't some enterprising photographer advertise "Matrimonial photographs — warranted to please." We cannot help thinking, however, that to be perfectly satisfactory some sort of verbal description should accompany each photograph. Imagine the disgust of an enamoured swain who, from the photograph, has conjured up visions of a dark-haired beauty, finding that the lady's tresses are of a fiery red !

REJLANDER'S PHOTOGRAPHIC STUDIES—THEIR TEACHINGS AND SUGGESTIONS.

BY A. H. WALL.

Classical and Comic Subjects.

In the days when Rejlander substituted sunlight for pencils and brushes, a good knowledge of chemistry was more important as an element of success in photography than it now is. But Rejlander was far more the artist than the chemist. He was incessantly pursued by a desire to so improve the practice of his beloved art, that all the delicate gradations of light and shade he saw in flesh and drapery might be fully realised ; and, with this end in view, any unusual effect, the result of some chance condition, would start him on a new series of experiments which too frequently landed him in a sea of perplexity, and more frequently resulted in spoiled negatives, ruined baths, and unaccountably eccentric defects than any discovery of real utility. In this way there was often a terrible waste of time, money, and patience. But none the less eager would he be when next he detected some apparently hopeful possibility to start a new series of mixtures and combinations, with the old light-hearted confidence and ardent impetuosity so thoroughly characteristic of the man. One day I found him in a state of gleeful delight, inspecting with loving admiration a negative he had just taken while one of these experimental fits was upon him.

The subject was a partially nude female figure, draped and posed in imitation of a classic statue, and had a strongly-marked broad black outline, such as some of the old Italian painters were so fond of introducing to give by contrast additional fleshiness and softness to the nude.

"Come here !" cried he ; "come here !" (in a state of feverish exultation and excitement). "Look at that ! Now, tell me, if you can, how that was got."

I confessed my inability to do so.

"Isn't it fine—glorious? Did you ever see anything like it before ?"

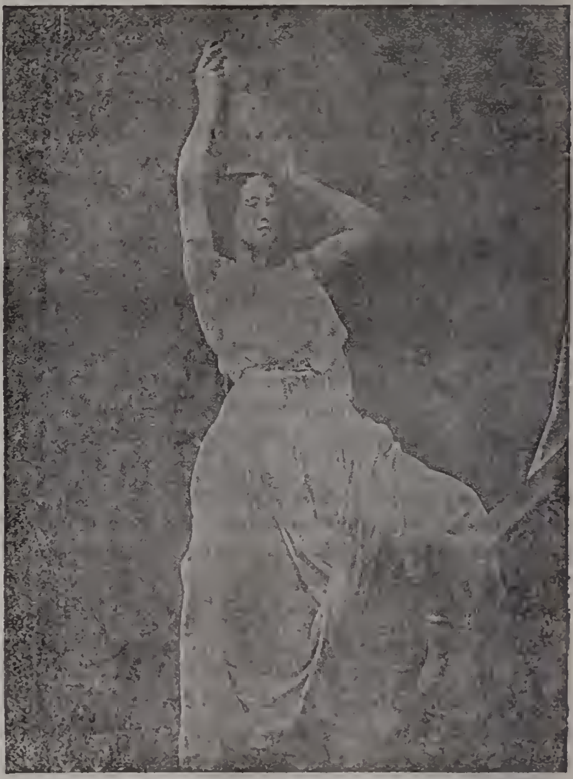
"In paintings—yes ; but never before in a photograph from life."

See how it improves the flesh—it's like a bit of Etty's flesh."

"Only," said I, "Etty did it without the thick black outline. How was that got ?"

"By accident at first," cried the triumphant artist-photographer ; "but now I can get it when I please."

And he firmly believed he could, and said he certainly would ; but I don't think he did. At any rate, although often enough at his studio afterwards, he never showed me another such specimen. Yet, on the day in question, I believe he had secured several negatives of precisely the same kind. Indeed, I fancy he did not get one that was without the wonderful improvement, or defect—intentionally in his belief, but perhaps, after all, accidentally.



DALLASTINT

Fig. 1.—Classic Study after Rejlander.

Rejlander was fond of classical subjects, and achieved a large measure of success in them. I have already spoken of his system of putting thin drapery on the models in a damp condition, so that it clung to the forms, revealing their lines and the action of the limbs. He used also to subject it to the discolouring effect of a bath of weak coffee, or some other staining liquid, to lessen the colour contrast of the flesh and drapery, that he might, in the resulting negative, secure all the gradations of light, shade, and reflection in both. In fact, herein was the great charm of such subjects. They enabled him to devote more attention to the artistic qualities of his work, instead of expending half his energies and thoughts upon difficulties which were simply mechanical and technical.

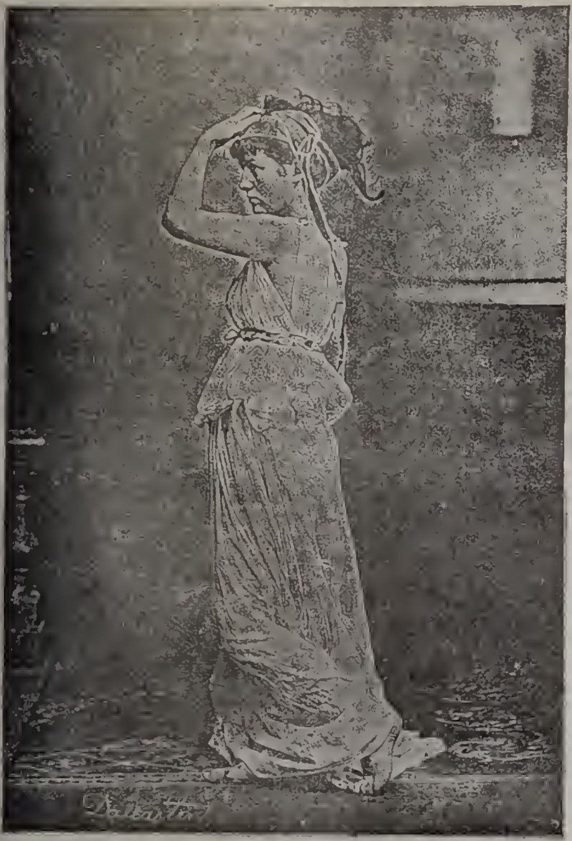


Fig. 2.—Classic Study after Rejlander.

In figs. 1 and 2 we have specimens of drapery treated in the way above described, and if you glance from these to fig. 3, I fancy you will at once perceive how superior from a picturesque and artistic point of view the two former are. Fig. 3 is, however, a fine specimen of simple and natural, but at the same time graceful, posing. There is nothing forced, nothing theatrical in it; but see how harmoniously the restfully-folded arms, and the placid

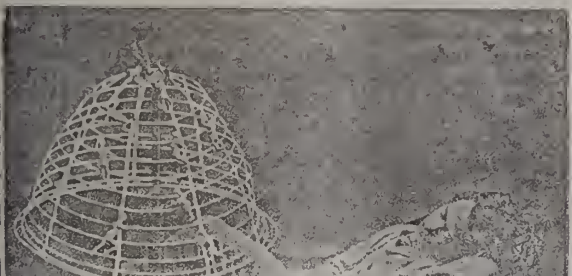
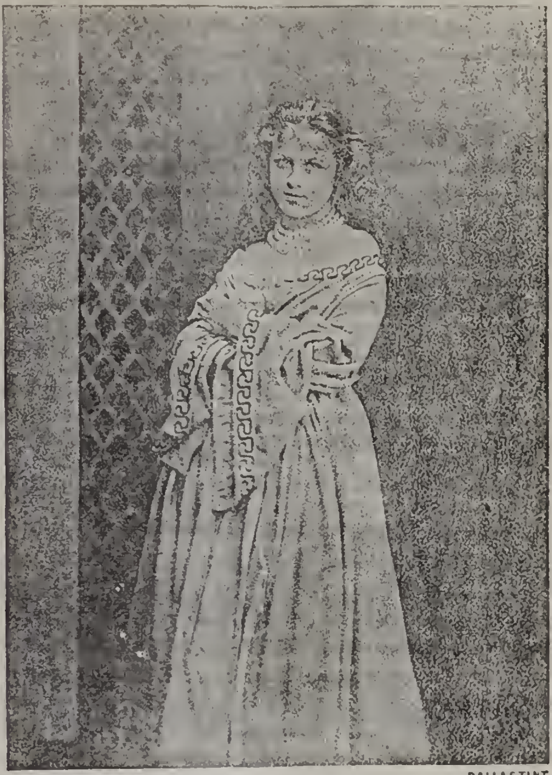


Fig. 4.—The Dream.



DALLASTINT

Fig. 3.—Study in Classic Drapery.

Fig. 5.—Barnaby Happy.

expression of content and satisfaction on the pleasant face, combine.

Remember, however, that the Dallastint copies are not the originals: they merely suggest them.

Humorous subjects abounded in Rejlander's negatives, and in these there was often a sly thrust of satire. "The Dream" belongs to the days of widely expanding crinolines, of which the crocodile crinolette is but a faint reflection. Both are, however, sufficiently nigh akin to the barbaric disfigurements of savages to make us understand how people who once enjoyed a high degree of civilisation drifted back into savage condition, and amidst the relics of cities and palaces built by their forefathers wandered, a skin-painting, cave-inhabiting race, intelectually little better than the beasts. Some such ideas may be troubling the sleep of this hapless bachelor, displayed by fig. 4.

In fig. 5, "Barnaby Happy," with a crape hat-band, standing at the entrance to what may be a ruin or a graveyard (I am afraid it is the latter) there is a suggestiveness of widowerhood that so associated is almost cruel, and makes one cry fye upon a meaning that may or may not have been meant. You remember the old epitaph about an old wife written by another of the heartless Barnaby type:—

"My wife is dead, here doth she lie,
She rests in peace, and so do I."

But there, it may be, after all, that Barnaby is not a widower, but a lover of the social glass, who, wandering from the road, has mistaken the arched porch of some old building for his cottage door.

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ON A MULTIPLEX DARK SLIDE FOR CARD-MOUNTED FILMS.

BY A. PUMPHREY.*

At our last meeting I read a short paper on my card-mounted flexible glass films, and I should like to supplement it by a description of a slide which is much better suited for them than the ordinary single or double dark slide, as I consider that to have a perfect film is of little use unless you have also some contrivance which allows of the operator taking advantage of reduced weight of films, to carry a greater number than he could of plates. I think the main object to be achieved by the use of films is to make a full day's work possible, if opportunity offers. I think nothing can be more tantalising than to work with a limited number of plates or films.

The slide I wish to describe to you is a modification of what I have used for plates; but in consequence of the films being mounted on an opaque and light material, it is only half the trouble and half the work as compared with glass plates. I did not mention this in the previous paper, as I had not proved the article in actual use. I have had some years' practice at films in one shape or the other, and am free to say that before this last development of films I always preferred working with plates, not liking my own medicine. With the trials I have made the last month I conclude I shall not go back to plates for any outdoor purpose.

The slide is about the thickness of two double dark slides. It will hold thirty card-mounted films. These are placed in the slide with the sensitive sides all facing the front, and do not require anything between the sensitive surface of one film and the back of the next film. When an exposure has been made, all that is needed is to remove the exposed film from the front of the slide to the back. This is such a simple process that it can be done by feeling in the dark bag. As soon as the exposed film is removed, the one underneath is ready for exposure. The proper order to proceed is to pass the slide into the dark bag with the sensitive side of the film uppermost, to unbolt the slide, take the exposed film from the top of the box, lay it in the bag, fasten the bolt, turn the slide over, and insert the exposed film, and repeating this until a distinctive feeling card has come to the surface, which will show that all have been exposed. It is easy to change a film. The whole-plate size can be done in thirty seconds. My son says he can change the quarter-size in ten seconds. At Kenilworth I made twenty-six exposures in rather less than two hours.

I will give the weight of several sizes of slides fully charged with thirty films:—Quarter size, 17 ounces; half-size, 28 ounces, whole-size, 44 ounces.

The slide can be adapted to any camera.

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A PHOTOGRAPHER'S TRIP TO THE SPANISH MAIN.

BY LYONEL CLARK.*

But my business is finished now, and I must return once more to La Guayra, to await a ship home, and to stay with kind friends—Messrs. Punchard and Co.'s staff—who are building the breakwater at La Gothe's port. Guanape, as their place is called, is a magnificent country house, near enough to the sea to be able in the morning to run down and plunge into it—though beware of sharks and the undertow. Here I found a fellow-amateur, one of Messrs. Punchard's staff, Dr. Batchelor, persevering manfully in the fascinating pursuit amidst difficulties that you here can't dream of—snowflake pyro as yellow as London snow, ammonia bottles going off with bangs, films falling off—even when we jammed the negatives in printing-frames, the films rose in the centre like a cheese soufflet; sensitised paper coming out such marvellous hues as to make you think photography in colours was possible. But persevering, in spite of all, with the dogged determination of the British character, he was turning out good work. We had some charming excursions together to Makonto, the Brighton of Venezuela, a little town nestling under the mighty Silla, on the banks of the little stream that springs from its flanks.

Again, a scramble up the Quebrada, at the back of their house, past the native huts, with their palisades of cacti, the *Candelabre Cereus* of our hothouses, that grows here 40 feet high; up the ravine, scrambling over the stones and boulders, gazing amazed at the strange and luxuriant vegetation. Pleasant reminiscences and pleasant memories of kind and hospitable friends. But the *Larne* has arrived, and I must say good-bye to Venezuela, good-bye and God bless you to Guanape and its kind inmates, good-bye to La Guayra and the old, truncated, pyramidal lighthouse, and Cape Blanco beyond, and the ships in the offing. The outermost ships fly the St. George's ensign, for there are diplomatic quarrels between the Venezuelan and our Government, and they have come to take away our Minister, Mr. St. John—another gentleman to whose kindness I'm deeply indebted. In fact, during the whole of my voyage I met with nothing but courtesy and consideration from everybody; and it is not surprising that sailors are always such good fellows, for if other parts of the world are like Venezuela and the West Indies, they must be very callous to the milk of human kindness not to soften under the flood of courtesy and good nature they must meet.

But we have left La Guayra behind, and are plunging away through the N.E. trades, and our cry is "Eastward Ho!" A few hours at Carupano, an uninteresting port under the lee of Margarita—the pearl island—and the *Larne* is heading for Trinidad cocas again, where I am to leave her.

The *Larne* is one of the R.M. cargo boats, and very comfortable she is, and her skipper a right good fellow; and we were a pleasant company on board. The son of the Governor of Trinidad was with us. We had been at Caracas together, and were old friends for the tropics, and I was sorry to have to leave him at Trinidad. He, too, is an amateur, and we could talk shop to our heart's content. I will show you two distinguished members of our crew, and prime favourites of all, from the captain—to whom they belonged—to the cabin-boy. But Trinidad is reached. I transfer to the *Solent*, an intercolonial boat; as nice a craft and as nice a lot of officers as the *Eden*, and I name particularly the chief and the purser, who I only hope will remember me as long as I remember them. We leave Trinidad in the evening, but not before I have time to get a view of the old P. and O. *Lord Ripon*, now a coal-hulk. How are the mighty fallen! A dash on shore at Grenada, a last look at the palm-fringed lagoon; now at St. Vincent, and now we are at Barbadoes again. And the homeward-bound mail, the *Don*, is there waiting. A rush round to say good-bye to my old friends on the *Eden*, ditto to my new ones on the *Solent*, and we are off on the last stage of the journey.

And now a few words of what I should take if it is ever my lot to make such a journey again. Don't take a large camera; or, if you will, see it is very strong and solid. Porters are most careless, and a journey on a mule's back would shake any ordinary camera to pieces. I should take a 5 by 4, I think, in preference. Take a very W A lens. Many a pretty bit I could not get for this want. As for plates, take some you know. Of the several plates I had with me or had met with out there, the "Thomas" was by far the best. They had been out there some time, but developed perfectly clean, and frilling was unknown. The light is good there, about half-past two English time, I should think, but you are generally obliged to do all your photography from 6 to 8.30 in the morning, when, of course, the light is less intense. After this hour the N.E. trade pours in with much violence, and only the most instantaneous work is possible, and the high sun overhead flattens all views. As for shutters, let them be simple. Remember that you have to mend all these yourselves. There are no handicrafts on the Main, so take something simple and easily taken to pieces and seen to. I consider a detective camera would be most useful. The people there don't understand photography, and you can't get them to stand to you. But don't get a detective like Doctor Wendel's photo-revolver; for if you presented that at a peon you would most likely get his knife or cutlass through you. Have one where you look down on the ground-glass or finder, and turn your back to the object. A Doctor Hutchinson, an American I met at Carácas, had a very good one, made by Scovill, and he got some very interesting street-scenes with it. He was round photographing Venezuela, and describing his experiences for some American newspaper; and I wonder much that some of our papers or publishing firms do not take up the same line. What an interesting work might be made in this way, illustrated by some of the photo-mechanical printing processes that Mr. Bolas told us about last week. What an advertisement for the Royal Mail would such a book be, dealing with the places their vessels visit. How few of those who flee the English winter know that in twelve days they can be in the tropics, in new lands, new scenes, eternal fine weather, no consulting the barometer when you are arranging an excursion—fix the date, that is all. A good many tourists now find their way southward, but nothing to the number that should go, and the score of expense should deter no one; living is not expensive there. I was absent ninety-six days, and my returned expenses to my employers, including travelling fares and actual living, was only £100—and I do not count on the hospitality that one good letter of introduction would bring you throughout the whole West India Islands. And I can sincerely advise every one to visit these wonderful islands, confident that I shall receive his earnest thanks for the advice.

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* Read before the Birmingham Photographic Society.

* Continued from page 328.

But all this time we have been rapidly steaming homeward to our Nifelheim, the abode of fogs and mists; we have passed the Azores again, and are plunging into a cold, easterly wind and head sea; my plates are used up, my magazine is useless, and my gun put away. Now we dash into a snow-storm, and now the look-out quietly reports land on the port bow. No excitement, nothing of the stirring times one reads of when the cry of "Land oh?" set everyone afire with joy. Ocean journeys are so shortened nowadays, that the arrival of a vessel causes no more excitement amongst the passengers than when the cad puts his head in the 'bus and sings out "Charing Cross!" St. Agnes light was shining brightly on our beam before twelve people on board were aware that we were in sight of land. And now we pass the Wolf, the Longhips, in quick succession; now the Lizard twins are shining right ahead; now Eddystone revolves on our starboard bow, and Plymouth breakwater is ahead; and now we are at anchor inside; the tender comes off and takes off a shivering (it is 2 a.m. and snowing) lot of passengers, who elect to have a twelve hours' railway journey up to London, instead of remaining quietly on board and going on to Southampton. Needless to say, I remained, and enjoyed the run up Channel immensely. Portland Bill, Southampton Water, Netley We have arrived at last; the tender comes off. Goodbye! to Captain Woolward and the doctor (another amateur photographer, and who, I regret, is not in England, or I would have got him to bring up some of his very interesting views). A slight difficulty with the Customs, who appear to confuse dry plates with dynamite, and cameras with infernal machines. A short two hours in pleasant company on the L. & S.W.; good bye at Waterloo; a dash and rattle in a handsome over the London stones, and I am home again, and my trip finished, to be stowed away in some corner of my brain; and perchance when I am old and feeble, and crouch over the blazing fire, it will make the old blood run fresh and free again, as I imagine myself one more gliding, under a vertical moon, through the tranquil Caribbean Sea, gazing on the dark blue mass, chain beyond chain, in endless range, those grand Cordilleras of the Spanish Main.

Patent Intelligence.

Applications for Letters Patent.

8132. Ernest de Pass, 68, Fleet Street, London, for "Improvements in photographic apparatus."—(*Mario Carquero*, France.) —6th June, 1887.

Patent on which the Sixth Year's Renewal Fee of £10 has been Paid.

2527 of 1881.—W. B. Woodbury.—Printing surfaces.

Official Abstract of Accepted Complete Specifications.

Cadett, 9836, 1886.—"Sensitized plates, films," &c. Coating machine: plates pass under rod to regulate thickness of coating; oscillating discharge valves for emulsion.

Froedman, 10,659, 1886.—"Sensitized plates, films," &c. Support for sensitive films: bichromated gelatine exposed and bleached with sulphurous acid.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

1061 of 1883.—W. R. Lake, (*West.*)—"Sensitizing photographic paper."

Specifications Published.

9155. George Joseph Sershall, of No. 371, Lodge Road, Hockley, Birmingham, in the county of Warwick, Artist, for "Improvements in vignette papers for photography."—Dated 14th July, 1886.

The patentee says—This invention consists of a new and useful method of making vignette papers for photography as hereinafter described. By my method the paper is printed by lithography or other suitable means on both sides; one side with red ink, and the other side with yellow ink, the gradation of tint from the solid colour to its faintest edge being obtained by means of stipple, spottle chalk, or otherwise; or instead of red and yellow inks any other two suitable colours may be used; or the paper may be printed as before named on one side only in any non-actinic colour for the same purpose. After the printing is completed it must be thoroughly dried, and then the paper must be rendered transparent by varnishing one or both sides or any other suitable means; and when the varnish becomes hardened the paper is ready for use; or, if preferred, the paper may be rendered transparent before being printed on.

Having now particularly described and ascertained the nature of my said invention, what I claim is—Producing vignette papers by printing by any suitable method non-actinic colour on to one side or on to both sides of paper already transparent or to be rendered transparent in the required parts after printing as herein described.

Correspondence.

BIBLIOGRAPHY OF PHOTOGRAPHY.

Sir,—In the list of photographic publications given by W. J. Harrison I note that several very interesting articles given in the *Magazine of Science* have been omitted from the list.

1839.

April 20th.—Vol. I., part 3, pages 18 to 20. 8vo, 1½d. per part. Publisher: W. Brittain, 11, Paternoster Row.

April 27th.—Vol. I., part 4, pages 25 to 27. Illustrated with two examples of Photogenic drawing—Flowers. Æthusa Cynapium or Fool's Parsley, and the other, Parnassa Pallustris. A beautiful snow white plant, and a reproduction or illustration of some fine lace.

May 4th.—Vol I., part 5, pages 33 to 36, giving two illustrations of wood cuts by above process.

July 6.—Vol. I., part 14, 3rd edition, pages 109 and 110. New photographic paper, in which the use of any salt of silver is dispensed with. By Mungo Ponton, Esq., F.R.S.E.

July 13.—Part 15, 2nd edition, pages 116 and 117. Notes on Daguerre's photography.

August 31.—Part 22, 2nd edition, pages 173 to 175. Principle of the Daguerreotype.

September 7.—Part 23, 3rd edition, page 180, Photogenic Actinometer, by Professor Daubeny. Pages 182 to 184. Mr. Talbot's Remarks on the Daguerreotype.

October 5.—Vol I., part 27, pages 215 and 216, Heliography.

October 20th.—Part 29, pages 227 to 229, Dioramic Painting by M. Daguerre.

1840.

January 18.—Wollaston's Camera Lucida Amici ditu, and Alexander's Graphic Mirror.

1841.

April 3.—Vol. III., part 1, No. 105, page 2.

July 31.—Vol. III., part 18, No. 122, pages 139 to 141, Calotype Pictures by H. F. Talbot.

October 2.—Vol. III., part 27, No. 131, page 214, Contribution by Mr. R. Hunt.

1842.

May 14.—Vol. IV., part 7, No. 163, pages 49 and 50, Pocket Camera Obscura, for use with Photogenic or Calotype paper, Illustrated by Œgidius, of Ipswich.

June 11.—Vol. IV., part 2, No. 167, pages 82 and 83, Impressions of Leaves, R. Russell.

November 12.—Vol. IV., part 33, No. 189, pages 261 and 262, Observations on Photo Processes, by W. P. Channing.

December 3.—Vol. IV., part 36, No. 192, pages 285 to 288, Thermography, by Robert Hunt. Very interesting.

December 24.—Vol. IV., part 39, No. 195, page 308.

1843.

Vol. V., No. 221, pages 101 to 104. Pages 117 and 118, an article on Electro-Gilding and Plating, by W. H. Fox-Talbot. No connection with photography barring the name, inserted merely to show the scientific character of our photogenic friend.

Vol. V., No. 231, page 184, Chromatype. A new photographic process by Robert Hunt. Exceedingly interesting.

Vol. V., No. 235, page 214, Tithonotypes, Daguerreotypes, by Dr. Draper, New York.

Vol. V., No. 249, page 323 and 324, Improvements in Photography, by W. H. Fox-Talbot.

Evidently the editor of the above journal was a very jealous kind of person, and certainly knew nothing of the Calotype process, for the way in which he sneers at the number of patents taken out by Fox-Talbot is very amusing. Here it is :—

Improvements in Photography.

We give beneath *another* patent taken out last month, by Mr. Fox Talbot, on "Improvement in Photography," though we must confess we think Mr. Talbot is *rather overdoing it by his numerous patents upon what is at best an amusing rather than a valuable art*, and in the present patent, which we give entire, we really do not see much novelty, and some things which we very much question if they will sustain a patent. We leave our readers, however, to decide. *The application to Printing is preposterously ridiculous.*

I may mention that the improvements consist of clearing calotypes from a yellow tint, improving the lights, making them more transparent and permanent, waxing the calotype pictures, improving the sensitiveness of calotype paper, and its chemical preparation by means of iodine and gallic acid, &c., &c., &c. There are eight improvements included in this patent too long to reproduce ; all of which undoubtedly at the time were improvements.

1844.

Vol. VI., No. 268. Page 62 and 63. Researches on Light. Calotype, by R. Hunt.

Vol. VI., No. 269. Page 70, 71, and 72. Researches on Light. Chromatype, by R. Hunt.

Vol. VI., No. 270. Page 79, and 80. Researches on Light, by R. Hunt.

Vol. VI., No. 271. Page 84. Researches on Light, by R. Hunt.

Vol. VI., No. 271. Page 85. Energiatype, a New Photo Process, by R. Hunt. May 27th, 1844.

Vol. VI., No. 286. Page 204. Daguerreotype Process.

Vol. VI., No. 291. Page 242. Mode of Colouring Daguerreotype Pictures, by Charles C. Page, M.D., Prof. Chem., Columbia College, Washington.

Would not the Philosophical Transactions of the Royal Society contain some original papers ? Not having access to them I cannot say. G. W. Valentine.

156, *High Street, Southampton, Hants.*

PHOTOGRAPHY IN NATURAL COLOURS.

Dear Sir,—The following cutting from the *Weekly Mail*, of June 4th, 1887 (a leading South Wales paper), will amuse your readers very much.

The originator evidently imagines that photography in "Natural Colours," and isochromatic photography, are one and the same thing.—Faithfully yours,

A. Fryer Evans.

Belvoir House, Chepstow Road, Newport, Mon.

Frederick Ives and the Photographer's Philosopher's Stone.—Mr. Miall has been producing *coloured photographs. So has somebody in America, it appears.* By washing his plates with a chlorophyl solution in addition to the ordinary preparation, Mr. F. E. Ives (says the *Boston Herald*) takes photographic pictures in which all the colours and tones of colour—including those which the ordinary plates do not return—are represented in their proper gradation of light and shade. A chlorophyl solution made from blue myrtle leaves has been found to be the best, although that from a few other leaves may be equal to it. The quality of the plates, when they are to be used immediately, is improved if the solution contains a trace of cosine. But the chlorophyl solution without the cosine may, by adding a little zinc in the preparation, be kept for a considerable time without losing its efficacy.

PHOTOGRAPHS OF LIGHTNING WANTED.

Sir,—May I beg to call your attention to the enclosed circular, which the council of the Royal Meteorological Society have just issued to all the photographic societies and clubs of Great Britain, in case you should think it worthy of some notice in your editorial columns.

The council believe that photography may settle several points connected with the discharge of lightning about which physicists differ very much, and hope that they may be able to enlist workers in this field of research.

The council have also inserted advertisements in the leading photographic journals, so as to leave no stone unturned in their endeavours to obtain the information they want.—Yours faithfully, William Marriott,

Assistant Secretary.

The circular referred to is as follows :—

ROYAL METEOROLOGICAL SOCIETY.

Established 1850. Incorporated by Royal Charter, 1866.

30, *Great George Street, Westminster, S.W.*
June, 1887.

Photographs of Lightning.

Sir,—The council of the Royal Meteorological Society are desirous of obtaining photographs of flashes of lightning, as they believe that a great deal of research on this subject can only be pursued by means of the camera.

The council would esteem it a great favour if you, or the Institution which you represent, could give them any assistance in this matter, either—

1. By sending them copies of any photographs of flashes of lightning that may have been already taken ;

2. By endeavouring to procure them yourself, or to interest others in the work.

It may perhaps be well to mention that the photography of lightning does not present any particular difficulties. If a rapid plate and an ordinary rapid doublet with full aperture be left uncovered at night during a thunderstorm for a short time, flashes of lightning will, after development, be found in some cases to have impressed themselves upon the plate. The only difficulty is the uncertainty whether any particular flash will happen to have been in the field of view.

The council hope that now the thunderstorm season is approaching, many photographers may be found willing to take up this interesting branch of their art.—I am, sir, your obedient servant, William Marriott, *Assistant Secretary.*

[See Editorial Notes on page 360.—Ed. P.N.]

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Proceedings of Societies.

London and Provincial Photographic Association.

This Society met as usual on Thursday, the 2nd inst., J. Traill Taylor in the chair.

The subject of the "Cellerier and Parkes" process of producing photographs in so-called natural colours was brought under consideration, and various modes of producing badly-coloured photographs explained. After a prolonged discussion, a resolution was passed by the meeting, condemning the title adopted by the "Cellerier Syndicate," that of photography in natural colours, as misleading to the public, and likely to be productive of fraud.

The Chairman gave an interesting resumé of Becquerel's experiments in heliochromy, and pointed to the analogy between these, and Carey Lea's recent researches.

L. Medland read an extract from No, 5 of the "Family Doctor" for 1885, in which the gist of Becquerel's plan of reproducing red and blue was set forth.

J. B. B. Wellington showed a specimen of red chloride, or photochloride of silver, prepared as directed by Carey Lea (page 337 last week's issue.) The properties differed from silver sub-chloride (Ag_2Cl) or silver chloride ($AgCl$) when used alone.

C. E. Brown (Melbourne) gave an outline of the position of commercial photography at the present time in his district. The failure of photographic societies in the colonies he attributed to local jealousies. The general character of work was much the same as that produced at home. About half the photographers continued to employ wet collodion, for the reason that, having busy studios, they were afraid to risk their reputation by possible failures with dry plates. Nearly all photographs were issued glazed, but vitreous photographs and collotypes were almost unknown. Carbon opals were in demand. The speaker then handed round a few examples of work issued by his firm.

A question was read regarding the action upon toning when an infinitesimal quantity of lime chloride is used in conjunction with gold—the proportions given being water 1 quart, gold terchloride 4 grains, and lime chloride 1 grain.

A. L. Henderson thought it would tend to bleach the prints. It would have no restraining power.

A. Mackie said that a toning bath need not of necessity contain anything more than chloride of gold and water; but it ought to be in a very diluted state.

F. York had tried the small addition of lime which was recently recommended by an American writer, and he failed to trace any effect from its addition.

"What action does citric acid have in preserving sensitized paper?" was next discussed.

The Chairman supposed the questioner also included analogous acids, such as tartaric, which was really better than citric for the purpose.

W. H. Harrison attributed the preservative action to the fact that nearly all such acids as those named act as de-oxidizers, and, as a consequence, tend to prevent discoloration of the silver compound.

The discussion was continued at length, but nothing new transpired.

Bank-Holiday-outing results were shown.

H. S. Starnes drew attention to a series of prints, including silver, chloride, and bromide ; also platinotypes which had been partly subjected to an atmosphere charged with sulphuretted hydrogen for a period of nine days. All had changed somewhat ; but two of the commercial bromide papers now in the market were less affected than any of the other prints.

Derby Photographic Society.

The members, to the number of twenty, paid a visit to Staunton Harold and Calke Abbey, on Saturday last, by permission of Earl Ferrers and Sir V. H. Crewe, under the leadership of J. W. Price. The weather was all that could be desired, and on arrival at Staunton Harold the party took negatives of all the most interesting spots about this beautiful estate. They then proceeded to the Saracen's Arms, where they were met by Messrs. Leadbetter and Chapman (stewards of Earl Ferrers and Sir V. H. Crewe), who entertained them at an excellent tea. Thanks were accorded to these gentlemen for their kindness. After tea a large group was taken on a 15 by 12 plate by Mr. Roberts (one of the members) ; also by Mr. Price and Mr. Keene. The journey to Calke Abbey was then continued, where some more plates were exposed, and the party returned to Derby, having thoroughly enjoyed a most successful excursion.

Birmingham Photographic Society.

The monthly meeting was held at the Technical School, Bridge Street, on May 26th, W. J. Harrison, F.G.S, in the chair. There was a good attendance.

The report of the excursion to Lichfield was read by A. Pumphrey. In it was mentioned that 177 pictures were obtained—some on Eastman's stripping films, and also Pumphrey's flexible films. A number of the members went over for a second time, not having secured all they wished on the previous visit. A large number of prints were shown ; some of the interiors of the Cathedral being very fine.

F. Osborne then read his paper on "Reminiscences of Photography," giving his experience as an amateur photographer for the last twenty-five years, having gone through most of the processes, from the Daguerreotype and calotype up to the present dry-plate. He described the same, and concluded with a biographical account of the old pioneers of photography in Birmingham, foremost among whom stood the Society's President, Dr. Hill Norris, the original inventor of the dry-plate processes.

A. Pumphrey read a second paper on "Flexible Films and Holders" (see page 364).

W. C. Welford then exhibited a number of cameras and shutters and other apparatus lent to him by various firms, notable among which were a detective camera by Newton and Co., and Newman's automatic shutter. He also showed street views and crowds he had taken the same day with the detective camera, which were remarkably good.

The meeting terminated with the Chairman announcing the excursion on the 30th May to Miller's Dale, Derbyshire, also the paper for June 23rd, "Printing by Artificial Light," by F. Birkett.

Edinburgh Photographic Society.

The eighth ordinary meeting of the current session was held in the Professional Hall, George Street, on 1st June, at eight o'clock, the President occupying the chair.

George Stewart was elected as an ordinary member.

Dr. Thomas W. Drinkwater read a paper on "Pyrogallic Acid and its Uses in Photography" (see page 357), which was highly appreciated, and was the subject of discussion.

J. M. Turnbull said he preferred to keep pyro in solution for development, because it was more convenient. It doubtless oxidized a little, but with the addition of sulphite of soda and sulphurous acid, and when kept well stoppered, it remained perfectly good for a long time. He had seen excellent negatives developed with it even after the solution was twelve months old.

James Jameson entirely agreed with Dr. Drinkwater in using dry pyro. A solution began to change from the moment it was made up ; whereas when used dry it could be depended upon to produce precisely the same results in each case, and at any interval of time.

A. A. Inglis found the Ilford Co.'s formula work well in his practice.

James Crighton developed with two stock solutions.

Dr. Drinkwater replied to some remarks made in reference to the manufacture of pyro, and reiterated his preference for keeping it in a dry state. He recommended a means of measuring it for use, contrived by Mr. Jameson some years ago, viz., a graduated glass tube, in which a sliding pencil-shaped piece of wood is adjusted. The tube is simply dipped into the dry chemical, and takes up exactly whatever quantity is desired.

The Secretary intimated that a strong desire had been expressed for one or more outdoor meetings on the Queen's Jubilee holiday, 17th inst., and that Dunfermline, Dollar Glen, Roslio, and St. Andrew's were places which had been thought of as suitable to visit. Members desirous of using the holiday in the manner proposed, should meet in the Council room, on Tuesday evenings 7th and 14th inst., to make arrangements, or otherwise signify their wish to join a party—the results of the day's work to be shown at the annual display in November.

J. M. Turnbull then proceeded to give a description of the process by which stripping film negatives were obtained, and exhibited to the members a number of films, and his manner of detaching them from their paper and glass supports.

W. Bashford referred to the stripped eburneum films of twenty years ago, and how long a good idea sometimes had to wait before its merits were generally recognised and turned to practical account.

James McGlashau remarked that care was needed in drying the film before removal, so as to secure the stage at which stripping was easy.

J. Wardale exhibited a new shutter release which consisted in a small brass ball being propelled pneumatically in a short tube, and caused to strike the trigger of the shutter, any shock being manifested after the exposure was made.

Grimstone's patent shutter for working between the lenses was exhibited by James Jameson, who spoke highly of its merits as a portable and ingenious piece of apparatus.

The ordinary meetings are suspended during July, August, and September.

Talk in the Studio.

Photographic Society of Great Britain.—The last ordinary meeting of the present session will be held on Tuesday, June 14, at 8 p.m., at the Gallery, 5a, Pall Mall East, when a paper on "Photo-Micrography, and its Value in Biological Research," will be read by Dr. Edgar W. Crookshank.

Nadar's Photograph of the Ruins of the Comic Opera.—This photograph, to which we alluded last week, has been sent to us. It was taken immediately after the conflagration on one of the American films, and with the Eastman-Walker roll-holder.

Action of Metals on Solutions of Silver Nitrate.—By J. B. Senderens (*Compt. rend.*, 104, 504-506).—If pure sheet lead is placed in a solution of silver nitrate containing not more than 20 grams per litre, when one equivalent of lead has been dissolved, only about three-fourths of an equivalent of silver is precipitated. When all the silver has been precipitated, it is found that two equivalents of lead have been dissolved, and the solution contains lead nitroso-nitrate. If an excess of lead is left in the solution, the nitroso-nitrate is decomposed, and the reaction becomes complete when three equivalents of lead have been dissolved and tribasic lead nitrite has been formed. The action of metallic lead on solutions of lead nitrate is very slow. Zinc, iron, tin, antimony, and aluminium behave in a similar manner. In the case of zinc, nitrous oxide is given off, together with a little nitrogen. The reaction is complete when four equivalents of zinc have undergone alteration, but only a small proportion of this passes into solution, the greater part remaining with the precipitated silver in the form of zinc hydroxide mixed with a little basic zinc nitrate. Under the same conditions, two equivalents of aluminium are altered, with the formation of the hydroxide and evolution of nitric oxide. A solution of zinc nitrate is not attacked by zinc in the cold, and aluminium is not attacked by nitric acid in the cold. The decomposition of the nitrate and precipitation of the metal are correlated phenomena, and the precipitation of the silver determines the reduction of the acid radicle in the new salt. This reduction begins before the precipitation is complete, and continues simultaneously with the precipitation of the remainder of the silver.—*Journal of Chemical Society.*

Quantitative Estimation of Wood in Paper. By C. Wurster (*Ber.*, 20, 808—810.)—Inasmuch as crude wood shavings have been introduced into the paper manufacture, and the paper prepared from them turns after some time yellow and then brown, and finally becomes unsightly, an estimation of the proportion of wood present becomes desirable. Dimethylparaphenylenediamine imparts a magenta colouration to paper containing wood, but no change is produced with paper prepared from linen or cotton fibre. In order to make this change quantitative, the paper to be examined is moistened, tested with the reagent, and the tint given is compared with those of standard papers tinted and arranged according to scale. As then the oxidation of the dimethylparaphenylenediamine to the red dye-stuff is quantitative, these standard papers can be prepared and estimated by some titrated oxidising solution, such as iodine. A few such estimations are given as examples.—*Journal of Chemical Society.*

Photographic Club.—The subject for discussion on June 15th will be "Backgrounds." Saturday outing at Gravesend; train from Fenchurch Street at 2.8 p.m.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Pipea and Cartea, Photographic News, 5, Furnival Street, E.C."

W. Holmes.—1. The articles have not yet been reprinted. 2. From the Society of Arts, John Street, Adelphi, London.

Lewis Medland.—This correspondent writes as follows:—"In your issue of last week it states, under the London and Provincial Club notes, that I exhibited a Newton's shutter; it should have been a Newman's shutter."

Lyonel Clark.—Thank you for sending it in so promptly.

G. E. Beroman.—1. Those sold by Edwards have answered very well in our hands, and as regards preparation you will find details in the Year-Book. 2. The book is an interesting one, and we thank you very much for offering to send it for our inspection, but we happen to have a copy.

H. W.—Strong alcohol will coagulate it immediately, and the best methylated spirit of commerce will serve very well.

H. C. Braun.—The elaborate preparation of the paper is necessary, as otherwise mealy prints result from the unequal thickness or from unequal swelling.

Wm. Lang, Jun.—We will write.

Aug. T. Harvey.—1. It is what we should have expected. You shall hear from us. 2. Thank you for the leaflet, with which we substantially agree.

Chloride.—You need add nothing, as in the course of a few days all the gold will go to the bottom as a purplish deposit.

T. Gams.—A rectilinear or symmetrical doublet of about six inches focus.

S.B.M.—We shall endeavour to deal thoroughly and exhaustively with the subject.

F. Holmes.—The potassium salt has not answered so well in our hands as the ammonium salt, but we are inclined to think that the mischief arose from the presence of a small proportion of carbonate. Most commercial samples of the potassium salt contain carbonate.

10.6.87

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1502.—*June* 17, 1887.

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EMERSON'S PICTURES FROM LIFE.*

Here we have a fine series of twenty photo-engravings from negatives taken by the author. After quoting from Browning—

> . . .
> "That Art remains the one way possible
> Of speaking truth, to mouths like mine at least,"

the author in his introduction lays as a dictum, ". . there is no such thing as abstract beauty in form or colour." He, however, hardly makes clear that which he wishes to convey by this, a regrettable matter, as some, by "abstract beauty," would understand absolute beauty, quite apart from humanity; while others would understand beauty as subjective to the ideas of the whole human race; and, again, another section would take the idea as being subjective to the minds of certain portions of the human race which they regard as cultured; or, in other words, as subjective to portions of the human race who have more or less consciously entered into a convention.

Photography may fail to be a faithful exponent of nature if its instruments are handled unfaithfully, but in spite of this, as the author pertinently observes, "that as a means of artistic expression, the camera is second only to the brush—how successful the artist is with either depends entirely on himself."

When we say that Emerson has so used his camera as to truly represent nature we say the highest, and it is in the true representation of nature that the future merit and worth of photography rests. He is too much of an artist than to attempt to represent by photography those things which cannot be shown in a single photograph, and yet which the eye can see—such things as a revolving wheel or an animal in rapid motion. The camera may in an instant register the wheel as if it were still, or secure a diagram of some momentary phase of the animal's motion—some phase which eye never saw, and never will see, because animals do not suddenly freeze into stone while jumping. An artist who understands his business can paint a revolving wheel or a jumping horse approximately as the eye sees it—that is, true to the only just standard; but the photographer may have to photograph a jumping horse a hundred times before he secures one picture which conveys the idea of motion. There is a burlesqued truth which is a very pernicious kind of falsehood, as when a photograph which really shows a train as at rest is presented to us, and we are told it represents a train in motion; or when we are given a photograph of a horse shown as at rest in some position in which no horse was ever at rest, and are told that this is a true photograph of a horse in motion. In short, the artist can only paint such subjects true to nature—as we see nature—when he takes into account the persistence of vision.

Ruskin touched the key-note of the naturalistic idea in painting, when he wrote, "wherever art is practised for its own sake, and the delight of the workman is in what he *does* and *produces*, instead of what he *interprets* or *exhibits*, there art has an influence of the most fatal kind on brain and heart, and it issues, if long pursued, in the destruction both of intellectual power and moral principle; whereas, art devoted humbly and self-forgetfully to the clear statement and record of the facts of the universe is always helpful and beneficent to mankind, full of comfort, strength, and salvation." Again, in the same lecture ("The Deteriorative Power of Conventional Art over Nations," delivered at the Kensington Museum in 1858), Ruskin says, "Art, followed as such, and for its own sake, irrespective of the interpretation of nature by it, is destructive of whatever is best and noblest in humanity." "*Interpretation*," says Ruskin, "never imitation." The instantaneous photograph imitates one phase of the revolving wheel with such machine-like exactness, that it shows the wheel as still: the artist interprets the revolution as the eye sees it, and often succeeds well.

Having with rare judgment steered clear of doubtful, and to the camera, impossible subjects, Emerson has given us some delightful photographic pictures which not only represent, but also interpret nature; perhaps the one which pleases us most is "The Grafter," in which one sees the old man leaning tenderly over the rose-stock, while the child looks on with that interest and wonder which characterizes early life. Emerson evidently intends to form a school in photography, and has resolved to show photography at its best. The time was when patchwork abominations, representing incongruities of object and light which no eye ever saw or healthy mind ever conceived, were looked upon as the highest efforts to which photography could soar; but things are changed for the better now-a-days; such meretricious eye-traps, if admitted into our exhibitions, so far from being medalled, do not even reach the exaltation of an honourable mention, and soon they will doubtless disappear altogether before a healthy appreciation of what is true in art. At the same time one must appreciate the labour of those who have worked honestly in the direction of the so-called "Combination Photography," even though their work may correspond to a period of degradation. The memorable Rejlander walked in this field, but seeing the difficulties of the situation, and the danger unless a master hand control the pieces, he relinquished it and deprecated its practice.

We do not feel disposed just now to criticise Emerson's twenty plates individually, as in doing so we should lose the main idea, which is the use of the camera in faithfully interpreting nature. They are very unequal in merit, as indeed are any twenty works by any artist, but they indicate a tendency, and by the following of this tendency we may hope for great things in the future.

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* "Pictures from Life in Field and Fen." By P. H. Emerson, London, 1887. (George Bell and Sons, York Street, Covent Garden.)

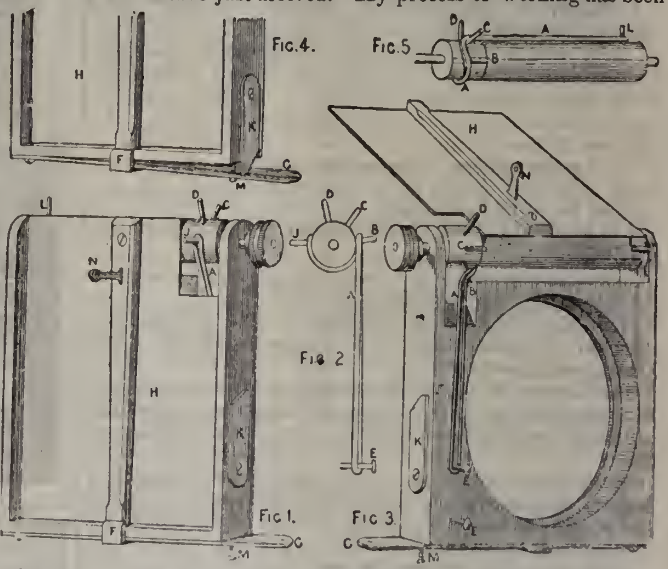
◆

RICHMOND'S INSTANTANEOUS SHUTTER.

From W. D. Richmond, who is known to our readers as the author of Richmond's "Grammar of Lithography," and as an active experimenter in photography, we have received a shutter which, for lightness, compactness, and absence of complication, stands out very markedly from the rank-and-file of shutters.

Fig 1 shows a front view as it stands after exposure. To set it ready for rapid use take the elastic band A, lap it round one of the spurs B, C, D, and hook it over the pin E as shown in fig. 2. Pressure of the finger upon the end G of the spring-catch F G will permit the band A to pull down the pin B, which raises the shutter H as seen in fig. 3. The band A then slips off the spur B, and acting then upon the spur J instantaneously closes the flap as shown in fig. 1. The rapidity may be increased by putting more tension upon the band A, by lapping it round the pin E′ instead of E, and still further so by lapping it once, or more, round both pins. The amount of opening will be made greater by putting the band A over C or D instead of over B, and by so doing the duration of full opening will bear a larger ratio to the whole exposure, and the picture will be more equally illuminated. If the band A be lapped over the spurs B and D twice or more, a fluttering motion will be imparted to the flap H, with a corresponding increase in the length of exposure.

By setting the detent K to keep open the spring catch F G as shown in fig. 4, the flap may be operated with considerable rapidity by twirling the milled head between the thumb and finger. While thus set the shutter may be opened from behind the camera, if a cord be attached to the projecting eye N, in which case a very light counterbalance weight at the other end of the cord will enable the operator to put it out of his hand during exposure. If while the detent is in this position the band A be passed under the rocker, over the spur C or D, and then looped over the pin L, it will lie temporarily out of use as shown in fig. 5. The flap H can now be used by turning the milled head, and any exposure can be given. Focussing can be done with the shutter so arranged.



◆

THE CHEMISTRY OF THE LATENT IMAGE.

BY DR. W. R. HODGKINSON, F.R.S.E.

The paper on chloride of silver in your recent issue by Carey Lea (page 327) is of the highest interest both to photographers and chemists.

At the suggestion and with the assistance of Captain Abney, I commenced some experiments three summers ago with the object to isolate the body formed on exposure of silver chloride or bromide. As a chemist only, reasoning from Abney's experiment with silver chloride in a perfectly dry state, that it undergoes no change on exposure to light, but only when water or substituted water is present, I thought it extremely likely that the coloured substance was an oxychloride produced by the oxygen of a water molecule replacing chlorine in one or more molecules of silver chloride, probably an oxychloride of this form

$$Ag_2Cl_2Ag_2O$$

The point has therefore been to obtain this coloured body in quantity, and devise a method of separating it from unacted-upon ordinary chloride or bromide. This was not an easy matter. Ammonia and hypo decompose the coloured body, and could not be used. Cold saturated solution of sodium and potassium chloride dissolve much silver chloride and bromide, but I find lithium chloride much better. It is more deliquescent, and a very strong syrupy solution can be obtained which dissolves silver chloride very easily when cold. All these chloride solutions produce a colour change in the exposed chloride of silver when boiled, and a decomposition with liberation of a gas and formation of metallic silver results.

A complete detail of my results up to date would more than fill the News, I fear, and also I am not by any means finished with the subject, as I depend on these fine days which have just arrived. My process of working has been to prepare about six ounces of silver chloride in the dark room, and wash most carefully with distilled water until so free from other salts that it begins to dissolve a little in the pure water. This I have exposed in long bottles, laid horizontally on a shaking table, in water, alcohol, and various salts solutions; sodium carbonate, potassium, nitrite, sodiums sulphite, silver nitrate, copper chloride, peroxide of hydrogen, and ammonia salts of various organic acids, both mono and dibasic. The only substance in which silver chloride is neutral to the action of light is strong ammonia. Some crystals of ammonia chloride of silver have now withstood three years' exposure without the least change of colour.

In all cases I find the first action of light to be the splitting off of chlorine from the silver chloride, and this chlorine in the nascent condition then attacks either the water, or, by preference, the salt in solution in the water. This action, as with ordinary chlorine solutions, acts in several stages. In the case of water alone, and especially in that of hydroxyl, the production of ozone was most marked. With nitrites the gas NO is liberated, as evidenced by the reddening on opening the bottles.

The silver compound produced differs in tint of colour, in each case being darkest—more inclined to blue purple—with the peroxide of hydrogen, nitrite, and especially with the organic acid salts of ammonia. After several months' exposure the substances are washed with water very often, in some cases as many as 150 times, to remove all traces of the salts in solution, a portion dried *in vacuo* over sulphuric acid, and then analysed, the remainder washed with lithium chloride solution. This operation takes much time, as it is necessary to shake up and allow to digest in the cold. Three months is quite a short time to extract unchanged chloride, and then it is incomplete; after which it must be again washed with water, and dried for analysis.

The total amount of changed chloride or bromide is very small, so that not much material is left after washing to work upon; but the analyses I have as yet done strengthen my idea that the substance is an oxychloride resp. bromide, but whether of the form—

$$\begin{array}{l} \text{Ag Cl} \\ \text{Ag} \\ \text{Ag} \\ \text{Ag Cl} \end{array}\!\!\begin{array}{l} \\ \text{O} \\ \\ \end{array}$$

Or,

$$Ag_3\,Cl_3\,Ag_2O$$

I cannot yet with any certainty say.

Certainly it appears to contain oxygen. The coloured substance, washed with water only, and dried *in vacuo*, loses weight on ignition. That which has been treated with chloride of lithium, washed, and dried, loses much more. Pure silver chloride or bromide may be heated over a blow-pipe flame for hours without loss. In the case of these coloured chlorides—or photo-chlorides, as Carey Lea calls them—there is always a "spitting" of the fused substance on the lid of the crucible, as though gas escaped from the fused mass.

I have heated some of the changed chloride in a glass tube in a vacuum, and, after many failures, obtained unmistakable evidence of oxygen, but, owing to an accident, was not able to measure it.

On fusing some exposed chloride, it may be seen that coloured particles float in a colourless liquid — the unchanged chloride.

The amount of oxygen in the formula first given would be about three per cent. So much I have not yet obtained as loss on ignition, but a little more than one cent. several times.

With a few weeks of the present quality sunshine, I hope to be able to make enough coloured chloride to settle the question as to the oxygen in it.

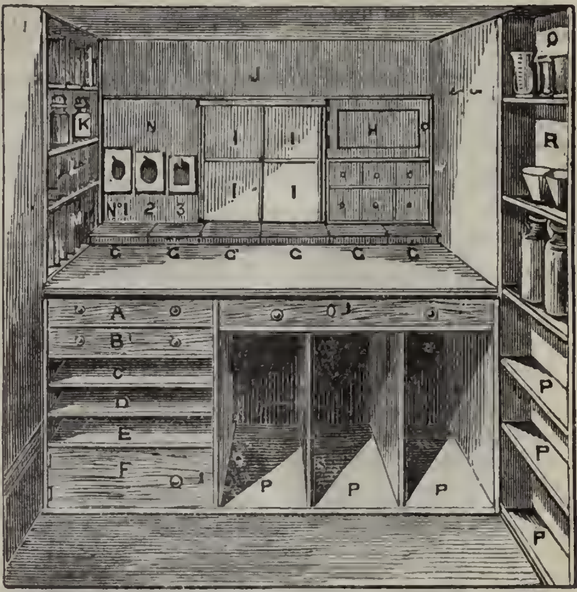
BUSINESS MANAGEMENT.

BY CRITICUS.

No. VII.

A conveniently fitted printing-room has been stated to possess advantages which facilitate the production of good work, thereby rendering its acquisition very desirable; but when a new place is being arranged it should be borne in mind that however complete the appointments of a small apartment for this purpose may be, they would in all probability prove quite inadequate for the production of large size photographs, or even those of less dimensions, when in quantity. In this department, as in others connected with the practice of the art, surrounding circumstances play an important *role* in the determination of precise details. Provisions amply sufficient for a small portrait business would be useless for a rush of general work. It is unlikely that a new place would gather a comparatively extravagant amount of business for some time after its establishment; indeed, if it exceeded a daily average of three or four sitters for the first year, the owner would have little cause to complain. If, for example, we take this average as applicable to the demand upon the silver printing department of a small business, greater economy both in time and material would no doubt result from the use of a commercially prepared sensitized paper, than it would be reasonable to expect from the plan of silvering, as it is sometimes called, from day to day or as required. The contention, however, would not hold good in the event of a run on stock orders, such as manufacturers' patterns, publication portraits, and views; birthday, Christmas, and Easter cards; or general trade work, which may necessitate the use of any quantity of material, ranging from twenty to five hundred sheets of sensitized albumen paper daily. Under such circumstances it would be cheaper and more satisfactory to prepare the paper at home.

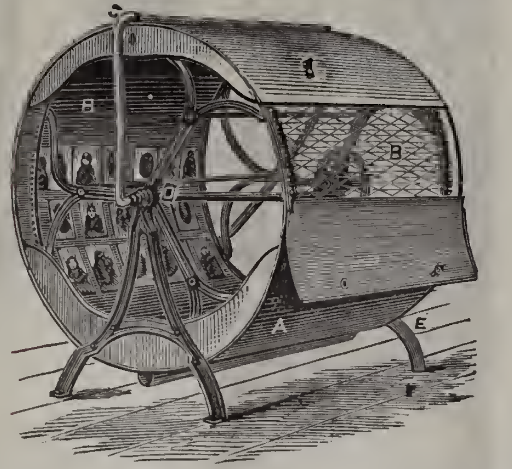
Hitherto we have not considered it necessary to illustrate our remarks with sketches, but, since a desire has been expressed that an outline of the studio mentioned on page 227 should be given (which has since appeared), we deem it advisable to include in this article a sketch which gives a tolerably accurate idea of the way to fit up a useful work-table in the printing room. The scale of measurement is half an inch to the foot. The drawer marked A is intended for albumenized paper; B, tinted paper, cardboard, *papier mineral*, &c.; C, the receptacle for sensitizing trays; D, toning dishes; E, hyposulphite of soda dishes; F, store cupboard for cuttings of sensitized paper, waste prints, blotting pads, filter paper, &c., impregnated with silver nitrate, and which, if permitted to become mixed with sweepings of the floor and other dirt, renders the task of reducing more tedious to the refiner, and less remunerative to the photographer: G, a series of boxes with hinged lids for storing sensitive paper, cut in sizes ready for use, and prints untoned; H, nests for negatives; I, window protected by one thickness of "Golden Fabric" on spring roller; J, K, L, P, shelves for negatives, printing frames, bottles, &c.



While the principal features pervading the silver printer's domain are under consideration, we would point to the advisability of securing an efficient means of saving residues. According to authority, the recoverable results have been variously estimated from fifty to ninety per cent. of the metal used. Few, however, can claim to do the work so thoroughly as to reach the higher estimate, but with ordinary care, enough silver can be stopped from going down the sink to make an appreciable item in the profits of a year's working. We have mentioned silver on account of its greater quantity, but attention should be directed to recover gold also.

If building space be limited, and it is decided that toning shall take place in this apartment, then an additional work-bench will be needed for the purpose of supporting the toning and other dishes when in use; but, as pointed out elsewhere, if the contrary be the case, we strongly recommend that the processes of washing, toning, and fixing be carried out in separate rooms. Under any circumstances the latter should not be done in the printing room on account of the baneful influence exercised by the sodium thiosulphate salt. It is of such a penetrating and destructive character that nothing appears to withstand its action for a lengthened period of time; especially floors, and cement, stone, bricks, mortar, or wood alike perish when subjected to its action. When these materials are fully saturated with the salt, they produce an abundant supply of crystals very beautiful in appearance, but a prolific cause of trouble to the silver printer; therefore, we say, keep this agent carefully, and in a safe place.

We need occupy very little space with methods in vogue for washing prints before or after fixing, since everybody acts according to their own discretion in such matters. Opinions are even divided as regards the best form of vessel to employ for the final washing. Slate tanks are much used, and are durable. Enamelled iron is, perhaps, still more so. Both kinds of vessel are suitable for the work, but unless they are of large dimensions there is some risk of injuring the prints when too great a force of water drives them into the corners. Our own verdict is in favour of a cylindrical vessel similar to that recommended by Marshall Wane ("Studios of Europe," page 189-190).



Prints washed by means of this arrangement, after the preliminary treatment of washing in four changes of water, and pressing each print separately with a sponge, are not found to contain any of the fixing agent. We have also frequently seen the prints yielded by a hundred sheets of paper sufficiently washed in four hours when made to circulate freely in a well-varnished and large sponge bath. The inlet was connected with the main, and syphons emptied the vessel every twenty minutes. A plentiful supply of water and efficient means of carrying away waste are among the most essential conditions in this department.

Prints after washing are generally conveyed to the mounting room and then dried. This apartment should be kept as free as possible from dust. It will be found a convenience to have a level work-bench built around the walls of the room, or a portion at all events. The accommodation thus afforded proves extremely useful when many photographs have to be mounted, and more particularly so if they happen to be of large size. Rolling presses and burnishers may be screwed to the benches. Enamelling prints can also take place in this apartment, also ordinary spotting, and retouching of negatives. Finishing photographs in oil, water, or monochrome, when executed on the premises, are usually assigned a separate location for the purpose. Some photographers, however, prefer to advertise this work by having it done in a quiet corner of the reception room.

Negatives are less likely to suffer injury when out of use if stored on shelves in a separate room, dry, and tolerably free from dust. The usual run of portrait negatives are not of much value after the first year or two, and in the majority of cases after the completion of the first commission, the smaller sizes do not require anything beyond the protection of an envelope, provided a number of the same size be supported on shelves as books are placed. Publication negatives are as a rule of much greater value, and it has been found better to store them in grooved boxes, notwithstanding the higher cost involved.

Perhaps it is scarcely necessary to mention that a damp room is detrimental to apparatus and plates—outer walls of a building are the greatest sinners in this respect—so that in choosing a store room or cupboard for keeping surplus stock or negatives, attention should first be given to this matter of freedom from damp.

STRIPPING FILMS.*

J. M. Turnbull explained the working of stripping film negatives, and, in the course of his remarks, gave a demonstration of the removal of both collodion and gelatine films from their paper and glass supports. He said the paper negative was a revival of a very old idea in connection with photography, and the latest form of argentic picture-making was in reality, to a great extent, a return to a good old style, the details of which are, now-a-days, only to be found in the records of the history of our art, or in the memories of a comparatively few of our veteran associates. Talbot, whose name for many years distinguished a process, was an eminent pioneer in this field of photography. Our townsman, D. O. Hill, produced pictures of this class, and his negatives were not much behind what we have now. Some of his work, both negative and positive, is to be found in the Society's album, and is characterised by breadth and artistic feeling.

Leon Warnerke brought out his transfer collodion films about twelve years ago, and a good display of them was made at the Society's Exhibition in 1876. His process was to build up on paper a film composed of alternate coatings of rubber and collodion, which, after development—the picture itself being on collodio-bromide emulsion—was laid down on glass. Subsequently it was damped on the back with benzine, and stripped. He extensively advertised these films at one-third of a penny per square inch. A feature in connection with them was their employment in the making of combination negatives when sky and other effects were desired, sometimes two, and even three, negatives being printed together. In this way also a style of portrait was introduced, the bust being printed as if in an oval frame. These films were slow compared with what we are accustomed to now.

Morgan and Kidd were among the first to introduce, commercially, paper coated with gelatine emulsion, since which time great advances have been made in preparation and practice in relation to it. When the negative is left unstripped from the paper, a certain disadvantage arises, from a degree of grain showing in the finished print, especially in soft sky portions, and when delicate half tones largely predominate. The printing also is slower than with glass negatives, owing to this nature of the support. These, and other drawbacks, no doubt suggested and hastened the adoption of the stripping film, which is only new in the sense of its composition and treatment. I may say that I stripped a number of large negatives for our late President Mr. Lessels a few years ago, which were intended for collotype printing. I coated the plates first with a thin solution of rubber, before the emulsion was put on. The negatives, on thin plates, were then first coated with collodion, followed with a stripping varnish. They came off quite successfully and easily, and the plate I now strip before you has been treated in the manner I have described. I draw a sharp knife all round the picture about a quarter of an inch from the edge, and by lifting a corner, it comes off without any trouble.

Strippers, as they have been termed, have only been in the market for a few weeks as yet. They are composed of a thin film of soluble gelatine on the paper support, over which the harder emulsion is laid, and which will stand considerable heat without dissolving. When it is decided to strip a negative I proceed in this way, which I think to be a decided improvement upon that given by the Eastman Company, because it is more simple and more expeditious, and at the same time giving equally perfect results. I found on experiment that there was no need to let the negative dry before stripping. After exposure and development, lay the picture down on glass which has been previously coated with either thin rubber or collodion—I prefer collodion. This should be done in a flat dish of water. When both are in contact, lift out and squeegee down. After two or three minutes put the plate into hot water, and the paper will begin at once to show signs of coming off. Pull it gently away with the finger, and you will find the negative now left upon the collodionised glass. A soluble gelatine will be found upon it which is easily removed. Now, while the plate is still wet, lay down the skin upon it, which is to act as the final support of the negative; or, what comes to the same thing, coat it with stripping varnish, and set up to dry. I found the formula given with the films took a very long time to accomplish this—some six hours and often more—and the cause seemed to me to be an excess of glycerine; I therefore have altered it considerably. I take—

---

* A demonstration given before the Edinburgh Photographic Society.

Coignet's gelatine	8 ounces
Glycerine	½ ounce
Carbolic acid	¼ ,,
Water	30 ounces
Methylated spirit	20 ,,

The gelatine is soaked in the 30 ounces of water, and, when soft, melted: the other ingredients being then added. This varnish will be found to dry rapidly, and renders the use of "skins" unnecessary.

Mr. **Turnbull** exhibited a negative prepared in this way, and stripped it by the aid of a knife as in the former case. He remarked that development and stripping, when a few negatives are in question, may go on continuously till all are finished, the one becoming ready as the other is stripped.

The lightness and portability of these films, either for carrying in the field or transport otherwise, were remarked upon, and the advantages they offered in cases where reversed pictures were required. Mr. Turnbull also alluded to a handy means of levelling plates while coating, which he had published in the journals about 1874; it was, to make use of Nettlefold's screws for picture-frames by fixing them in a board at points forming a triangle, raising or lowering them as required till a perfect level is obtained. The plate being warmed, coating is then made easy and regular.

The roller-slide, and the various improvements effected upon its introduction about thirty years ago, was briefly gone into, Eastman, Lejeune and Perken, Morgan and Kidd, Warnerke, and McKellen's apparatus being severally referred to, as also the tissues of Woodbury, Vergara, Pumphrey, &c.

A vote of thanks was accorded to Mr. Turnbull for his interesting and timely demonstration and remarks.

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.

> "Who lists to see whatever Nature, Arte,
> And Heaven, could doo; O, Rome, thee let him see,
> In case thy greatness he can gesse in hearte,
> By that which but the picture is of thee."
>
> —*Spenser.*

Our train neared Rome at daybreak, ushered in by rain. The Campagna stretched around, with its memorials of a bygone age when Rome ruled the world.

We passed long remnants of ruined aqueducts, and here and there an ancient tomb. We soon crossed the Tiber, passed by the gate of St. Paul, and the Protestant cemetery with the Pyramid of Caius Cestus, and, skirting the Aurelian wall, in a few minutes were in Rome.

Forbes, in his admirable guide-book, takes the Piazzi del Popolo as the starting-point for sightseers; it is well-situated at one end of the city, whence roads radiate to all parts.

Rome was crowding up for the coming Carnival, and we secured the last room in the comfortable Hotel Russie on the Piazzi del Popolo at the foot of the Pincian Hill. The morning continued wet, but very still, and we spent it in photographing many characteristic bits in the exquisite garden on the Pincian. Most of our work was done under an umbrella, but every leaf was still, and many of the pictures are highly satisfactory.

The fountain of Moses, with its surrounding palms and other trees; the statue of Raffaelle; the long avenue, with its double line of marble busts; the water clock, weeping willow, and pond, were all good subjects.

A good military band plays on the Pincian in the afternoon. Chairs are provided for the promenaders, and the *élite* of Rome drive round the garden. The view from the terrace, with the sun setting behind Rome and St. Peter's, is very fine. One end of the hill leads down to the head of the great flight of steps of the Trinita di Monte, where the models congregate and bask in the sun. There was no lack of boys in the picturesque brigand costume to stand for a small consideration. The supply exceeds the demand. One small Roman followed us, and we have him as he sat on a bank curled up under a prickly pear bush. The steps of the Trinita di Monte lead down to the Piazza di Spagna, the great English quarter. Busses leave here for all parts of the city; it is but a short drive down to the Tiber, and over the bridge of St. Angelo, to St. Peter's.

Our experiences in obtaining permission to photograph the interior of this church of churches may interest those who embark on a like quest. A knowledge of Italian—which, unfortunately, we did not possess—would be of the greatest help.

A workman engaged on restoration gave us the address of a certain Signor Rugerio, residing about two miles off, as the right man to apply to. Him we soon called upon, were shown through several large rooms with stone floors, to one where sat, at a desk, a good-looking old man, apparently a dignitary of the church.

After exhibiting passport and permits from other places, and explaining our want, Signor R. wrote a short note which he did not sign, and told us to give it to the custodian in the church. This was in the afternoon. We slept well as usual, little thinking of the troubles that awaited us on the morrow.

Arriving at St. Peter's about nine a.m., the outside porter took us to the office of the custodian, who read the note and wrote another, which, he said, must be taken to Signor R. to sign. In vain we explained that we had to catch the one p.m train to Naples. No matter, the letter must be "scritto." We took a carriage to Signor R.'s house, only to hear that he was out, and would be, till twelve o'clock. Back at once with a loss of two lire, and twenty-five minutes.

Outside porter evidently felt for us, and sent a boy to guide us round to an office at the back of St. Peter's, where he said Signor R. would probably be. The clerk there read the custodian's letter, crossed it through, and wrote another; and just as we were about to thank him for his prompt kindness, he told us to take it to one Signor Rugerio, residing at 2, Piano 70, Via Capritaria, to have it signed. We replied indignantly that we knew all about that, had been there twice and would not go again, and that we should be quite content with *his* signature. (It is wonderful what a command of Italian language you have when so bandied about.) "Impossible; Signor R. must sign it." Gross loss here of twopence for boy, much temper, and a quarter of an hour. We again tried to work upon the feelings of the custodion within the church, but he was simply adamant, and by way of passing us on, suggested that Signor Rugerio was probably in the Sacristy. Next puzzle, find the Sacristy. After wandering along the vast aisles of the church, a priest showed us a door, through which we passed, and traversed many passages leading to the grand circular sacristy, where a company of young priests were warming their hands over a large charcoal brazier. The inquiry as to the whereabouts of Signor Rugerio elicited the reply that he was "in choro," and would be out in half an hour. Taking this to mean that he was singing in the morning service, we soon found the chapel, and behold, there he sat, practically as far away as if at his own house. We could not resign the quest, so merely left to photograph the outside of the great church, colonnades, and fountains. Returning about 10·35, the porter (who was by this time greatly interested in the case) seemed much troubled, as he thought Signor Rugerio had just gone home. However, signing to us to stay where we were, he walked along the great corridor leading towards the Vatican. He soon looked back with radiant face, took off his hat, motioning us to follow at a distance, and take our cue from him, and walked forward to meet two figures, one of whom was indeed Signor Rugerio. And now ensued a big talk. My friend had as thorough a command of German as I of English; Signor Rugerio and his friend spoke French and Italian, and the porter Italian. Hats off, in imitation of the porter, we eloquently pleaded our cause. That it was of the utmost importance that we should leave for Naples by the one p.m. train; that I had already been to his house twice, and that we merely wished to take two or three views of the interior. We were too many for the old man; a scrap of paper and pencil, and he wrote a few words, but (despair and anguish!) such an important document required a stamp, and I must at once accompany him to his house to have it stamped.

At this the porter nearly fell on his knees, and we stood a good chance of excommunication.

We set to again, *his* friend taking our part; the old man's features relaxed, he signed the warrant, and all went "merry as a marriage bell." The porter, wild with joy, accepted his tip, and the custodian, on receiving the permit, said that we were now at liberty to proceed. The time was short, but the interior of St. Peter's is full of light. We obtained three or four good views, including one of the beautiful marble font with two cherubs, by Michael Angelo, and we just caught the train to Naples. We spent more time in Rome on our return journey, so will reserve our Neapolitan experiences at present. There is no necessity to give the Italians a lesson in the art of deception, and yet we were guilty of so doing on one occasion; it happened in this wise. While driving by the hour (the best way for photographing in Rome), we alighted at the courtyard of the Borghese Palace, and proceeded as usual to set the camera up. Being soon pounced upon, to gain time we innocently showed the pouncer an old permit from the Secretary for the Preservation of Ancient Roman Monuments; he took this paper to the office, but soon returned, saying that we must write to Prince Borghese. My friend came to the rescue, and while he engaged the man in conversation behind one of the massive pillars, and took down the address of the Prince, the fell deed was done. Verily, stolen fruit is sweet.

Continuing our ramble, we passed a side street where stands a medieval tower, called by Hawthorne, in his charming story "Transformation," Hilda's Tower; it is also called the Tower of the Monkey from the following legend. Years ago, the owner kept a monkey, who one day seized a baby and carried it up to the top of the tower. The parents vowed a shrine if the baby were returned. The monkey descended safely with the child, by the water spout. The shrine was erected, and every evening the lamp is lighted.

The tower was photographed from the crowded pavement, and we passed onward to the banks of the Tiber, where, at a certain point, by climbing down the bank, we obtained a photo of the well-known view, embracing the castle of St. Angelo on the right, the river in the foreground with the bridge of St. Angelo, and the dome of St. Peter's as a centre, and the picturesque old houses on the left. With the yellow mud of old Father Tiber clinging to our boots and tripod, we passed on to take an instantaneous view of the bridge of St. Angelo, as seen from the balcony of a restaurant hard by.

This bridge is constantly crowded with vehicles and foot passengers, troops of soldiers, carriages innumerable, conveying visitors to St. Peter's and the Vatican; visitors of many nationalities, English, American, and German predominating. It is a great thoroughfare, and made a capital instantaneous photo. We next went on towards the island in the Tiber said to be the home of those descended from the most ancient Romans. We dived down narrow slums and dirty streets, many of them ending abruptly on the banks of the river, from whence the houses on the opposite bank look delightfully picturesque as they tower above the muddy shore. All their back rooms apparently lacked outside walls, and were full of clothes drying. Want of time and unsavoury smells forbade a long tarriance at any point, and we passed on to a large district of old Rome, which has the appearance of having been just destroyed by earthquake. "Improvements" were going on; many narrow old streets have been cleared away, great river walls were in course of erection, and new bridges building, and the melancholy march of civilisation bids soon to turn this part of the city into a modern Paris, wiping out the historical associations with which it so lately teemed. No work for the camera here, and sadly we turned away, but were soon in the heart of squalid, dirty Rome again.

We photographed the broken down old stone bridge at the island, and plunged into the Ghetto or Jew's quarter, which is close at hand. The people were mostly sitting at their doorways, busy at divers occupations, such as dissecting old boots and shoes, sorting rags, and pulling garments to pieces.

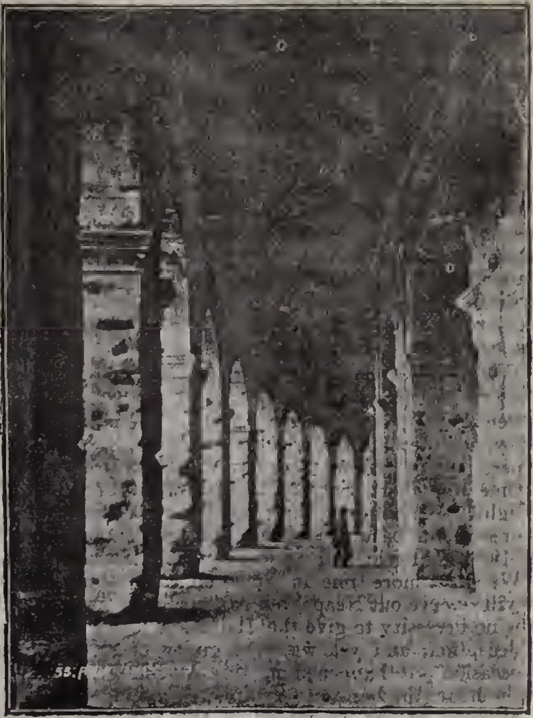
The interiors of the houses were in keeping with the people—dismal, dirty, and abounding in cast-off clothing, and goods wherein the Jew deals. On Sunday morning trade thrives in the Ghetto; country carts, musical with numerous bells under the seats, are driven in from the Campagna and neighbouring towns by brigand looking men; the gay contadina is also there in full Roman costume of brilliant colours. Sunday morning is the time to see the Ghetto at its best. We came out at the ancient circular temple of Vesta, a good photographic subject on the river bank. Here we turned to the left, and keeping along under the Palatine Hill, came straight to the Forum.

Having expended much time and trouble, two years ago, in obtaining a written permit to photograph the ruins of Rome, we determined not to go through the ordeal again, but to show our old permit, which we accordingly did. The custodian read it carefully through, and finding the weak point, said that it was two years old, and of no use; our passports proved our identity, and a silver pointed argument worked the rest.

The splendid old arches of Septimus, Severus, and of Titus, and the columns of the Temple of Neptune, made good representative pictures of the many fine buildings. The Forum, after the seventh century, became gradually buried to a depth of thirty feet with soil, débris, and rubbish; accumulations from the floods of the Tiber, together with vegetation, and rain deposits, helped to fill up the valleys, and the Seven Hills are not such marked features as they were when Rome was founded, neither are the Tiber's floods so disastrous.

The Via Sacra runs through the Forum, the ancient pavement of 174 B.C. having been exposed by excavation. Continuing our ramble, we came to the stupendous ruin of the Coliseum; effective photos can be taken from many points inside and out. We were struck with the view looking along the great corridor under the outside part of the building, showing the massive stonework, and the countless holes from which the iron cramps have been ruthlessly taken.

The Coliseum was built by captive Jews after the fall of Jerusalem; the material is travertine stone, a lime deposit plentiful around Rome. It held one hundred thousand people, and could be emptied in ten minutes through eighty arched doorways. We climbed down with our camera to explore the underground passages, but were speedily told that no one was allowed below unless with a special permit; probably the passages are intricate and



dangerous. The view from the upper walls is very fine, both of the Coliseum itself, the neighbouring Palatine Hill, and the surrounding city.

Leaving the Coliseum by the slope of the Cælian Hill, we came to the beautifully situated church of St. John Lateran. There have been many churches on this spot: the first was overthrown by earthquake in 961; the next destroyed by fire in 1308; it was rebuilt only to be burnt down fifty years afterwards, and was soon again rebuilt. From the wide portico in front, the eye roams over the open space to the old wall and the gate of S. Giovanni; beyond stretches the Campagna to the foot of the Alban Hills, their rich purple backed up by snowy peaked Apennines. The interior of the church is vast, and rich in marbles and mosaics, with a flat ceiling in the Italian style; there are many richly decorated chapels and monuments.

For once, no custodian appeared as we entered. Taking advantage of this circumstance, we speedily set the camera up in a corner by the door, where it was not conspicuous; we there left it, intending to give the picture ten minutes' exposure, if possible; nine minutes had passed, when we saw a man coming down from the upper end of the church; he had seen our instrument as we had walked towards it, and he told us that photography was not allowed. Nine and a half minutes had elapsed, and to oblige him we put the cap on the lens, and bowed acquiescence with his wishes. He was mollified by our giving in so quickly, and, after some persuasion, allowed us to take one picture in the adjoining twelfth century cloister. We have a great partiality for cloisters, and this one, with its twisted marble pillars, mosaics, curved centre well, and rippling fountain, was an excellent subject. The scent of many violets pervaded the air, the place was green and beautiful, and might have been miles away from the city. The man seemed anxious that we should not be discovered photographing, so we only took one view. We tried him again as to the interior of the church, but he said that it was quite impossible without a permit; he little knew that we had secured what proved to be an excellent picture. An attempt to photograph under the portico outside was quickly met with what *may* have been a blessing, but what to our unsophisticated ears sounded like a torrent of indignant remonstrance on the part of the porter, so we departed in peace.

In the compass of a short paper we can give but little more than our photographic experiences in Rome, and we strongly advise any one who should go there on a like quest to spend at least a week without his camera first. Let him go sight-seeing all day, and, if need be, read up the subject in the evening; after a good hard week's work he will know something of Rome, and will have discovered many of the artistic points, and how best to set about photographing them.

There is no lack of subjects on the quiet Aventine Hill, with its monasteries and cloisters, or among the ruined palaces of the Palatine Hill. The views as seen from the top of the Capitol Tower (about the centre of Rome) are as entrancing as they are full of interest. A large square near the Ghetto (the Campo di Fiori) is the scene of a great market on Wednesdays; it gave us a good instantaneous photograph, with its masses of people, fruit, and great sun shades.

In the church of S. Pietro, in Vincolo, is the great statue of Moses, by Michael Angelo, and, strange to say, we were allowed to photograph it. Of course, photos of it, and many of the subjects we have named, may be bought in Rome, but our object was to obtain a good set of quarter-plate negatives wherewith to make lantern slides.

Rome is famous for its abundance of good water; you see fountains everywhere; each great house has its courtyard and fountain, the latter often clothed with maidenhair; but the chief of the fountains is the fountain of Trevi; the water comes over in a grand semi-circular cascade, and from the surrounding marble rocks. There are figures of Neptune and his steeds, Tritons blowing their horns, and many others.

There is a tradition that by taking a parting draught, and throwing a sou into the water, the traveller will return to Rome. We had tested the truth of this, for did we not return again and again?

Long may the fountain exercise its charm, for there are thousands of subjects for the artist and the photographer, and of intellectual food among the historical associations, sufficient to occupy a lifetime spent there.

Notes.

The Report of the Master of the Mint, referred to last week as containing a photographic plate of the Jubilee Medal and new coins, contains a good deal of information of general interest.

The average monthly price of silver during 1886 is calculated, showing a range from $42\frac{5}{16}$ pence in August to $46\frac{3}{4}$ pence in January and March. The lowest point was reached on the 3rd of August, when 42 pence was quoted, and the highest price of the year—47 pence—was touched in January and December. No gold was coined in England during 1886.

The model from which the Jubilee Medal was made was electrotyped in iron, the bath used being one containing sulphate of iron and sulphate of magnesium in equivalent proportions, the solution having a specific gravity of 1·155, and when the bath is acid it must be rendered almost neutral by magnesium carbonate. Two Smee cells coupled for intensity were used.

On the 1st of November next, the Exhibition of the Photographic Society of Ireland is to be opened in the rooms of the Royal Hibernian Academy of Arts, Dublin, and twenty-one medals are to be given. Full particulars can be had from Greenwood Pim, Secretary of the Exhibition Committee, at the Royal Hibernian Academy, Lower Abbey Street, Dublin.

From a conversation we had the other day with the head of a leading firm of photo-zincographers, it would appear that photographers engaged in this business cannot be got to use dry-plates. "What is the objection?" we asked; "is it that gelatine plates cannot be got to dry so rapidly as collodion?"—the objection advanced by another firm to the employment of dry-plates. "No," was the answer, "I do not think that is it. I believe that our men find that dry-plates cannot be 'dodged' so easily as wet ones. The latter are capable of a good deal of manipulation, and portions of the plate can be worked upon if necessary by the operator to produce particular effects. A short time ago we had an experienced dry-plate worker in our employ, and when he was first engaged he had *carte blanche* to use dry-plates if he chose. He started with gelatine, but in a short time he soon took up with collodion. The difficulty of seeing how the plate is going on during development, the men say, is a great objection to gelatine."

There are symptoms of a reaction in the public taste with regard to miniatures. The miniatures in the Academy, instead of being stowed away in an obscure corner as has hitherto been the case, have been brought boldly out into the centre of the room and honoured with a special stand. The *American Architect and Building News*, in its remarks on the Paris Salon, says:—"The water colours seem swallowed up by the fashionable pastels, but miniatures are increasing. Some are very charming, and make one desire that such portraits may some day become fashionable again. Photographs never have and never will take their place." Neither the grammar of the last sentence, nor the opinion expressed, is a model of correctness. Photographs most certainly have taken the place of the old style of miniature; as to the miniature of the future that is another matter. It would be a good thing if the taste for miniature portraiture were revived. Photographers would gain, as there would then be a standard of comparison. Between the life-size portrait of the painter, and the work of the photographer, is a wide gulf. It must also not be forgotten that the miniature painter of the future will have to depend largely upon photographs.

A writer in the *Bat*, who was at Ascot, wants to know what becomes of all the photographs the itinerant artist takes year after year. Of course, he remarks, a certain number are bought, but "a great majority are taken on spec', without the sanction of the sitters, and remain on the photographer's hands; and although they may clean a few of the plates and re-use them, they must still have a number left." This is not very likely. Why should a photographer keep a speculative ferrotype when the plate can be so easily used again? The suggestion which the writer goes on to make—namely, that as people already collect postage stamps, autographs, and coins, they might also collect unclaimed race-course photographs—is no doubt made jokingly.

There is great room for improvement in photographic albums. Of late the fashion has run in the direction of bad taste, and the object appears to be the gaudy decoration of the page, rather than the display of the photograph to advantage. A day or two ago we saw a variety of cabinet albums exhibited in one of the largest stationary firms in London, and we do not hesitate to say that for downright inappropriateness to the purpose for which they were designed, the decorated pages would be hard to beat. One page had a coloured band, about two and a-half inches broad, stretching diagonally from corner to corner, and cut in the centre by the photograph. Another had the photograph stuck in the midst of a gaudy spray of flowers, the stalk of which continued the line of some frilling on the lady's bust, and had a most ludicrous effect. A third had evidently been specially designed for the portrait of a naval or yachting gentleman. At the side was a highly-coloured shell-fish of the whelk species browsing on seaweed; at the lower corner was a seascape which, as near as anyone could make out, represented a waterspout or submarine earthquake. On the top was another marine picture, with sundry ships and steamers dotted about, and a sky in the distance very suggestive of the explosion of a powder magazine. A fourth was of a military character, and had a photograph of Lord Wolseley in the middle, surrounded by military scenes of a penny-panorama-of-the-Lord-Mayor's-show type. Anything more puerile and less calculated to show off the photograph cannot be conceived, and these were albums of the "very best make." Is it not possible to emancipate the album from the influence of the Lowther Arcade style of art?

One of the London daily papers might do worse than follow the example of the *New York Herald*, which some weeks ago devoted an article to the art of retouching negatives. The *Herald's* remarks, which are practical as well as theoretical, appear to have been called forth by the excessive use of retouching by American photographers, and the injudicious way it is applied, "due to the over-existing competition in all branches of industry, and to the lack of artistic knowledge in the greater number of professional photographers, who employ hands which are only fit to spoil a good picture, provided the work is cheap, and plenty of it put in for the money." Nothing is more hideous than unskilful retouching, and America is not alone in furnishing examples.

NOTES FROM NEW YORK.

Since the annual meeting of the New York Society of Amateur Photographers in April, there have been three additional meetings held. At the technical meeting of May 11th Lieut. Bruns, of the U. S. Navy, read a communication "On the Best Way to Determine the Right Exposure of a Plate." He had looked up the literature on the subject, and was surprised to find so little information that would guide an inexperienced amateur to tell very closely how long to expose a plate. His plan was to use a piece of sensitized plain silvered paper as a guide. Knowing that the paper required so many seconds to turn black in bright sunlight, it was only necessary to determine at the same time how long a plate of a given make should be exposed in the camera, to establish a certain ratio between the two. Having ascertained the right exposure for the plate, we take another day with a weak light.

On that day we see how much longer it takes to turn the paper black than it did on the standard day; hence the light must be so much weaker, and we must correspondingly expose the plate proportionately so many seconds longer.

It was using chloride of silver to test bromide of silver. The discussion evoked showed the uncertainty and uselessness of the plan, for it was easily proved that on a bromide plate a photograph by gaslight was readily made which would have no effect on chloride of silver paper. Hence the supposed standard was of no avail.

Mr. Newton regarded it as the best policy to slightly over-expose, and then to use a weak developer.

Another gentleman considered it advisable to expose for the deep shadows in a picture, and control the over-exposed portions by manipulating the developer.

The general drift of the discussion was strongly against the proposed standard, and the matter was referred to a committee for further experiment.

At a lantern exhibition on May 25th, about thirty collodio-bromide slides of Switzerland, English scenery, and views in Florida and Cape Cod, Mass., by Mr. Horace Gridley, who took the first medal at one of your exhibitions for his monk picture, were shown on the screen with good effect. The work indicated that he was an adept in this branch, and was all the more commendable when it was learned that the emulsion was prepared by himself after Brooks' formula.

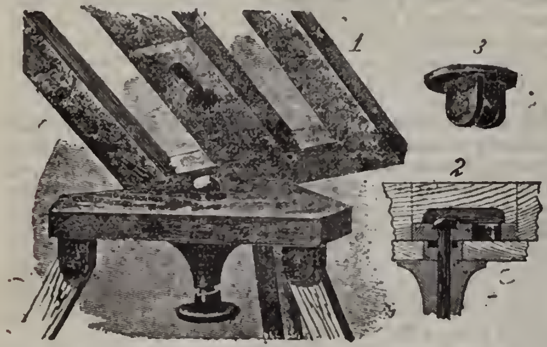
On June 1st, Mr. Edward Leaming, of the Society, gave a special lantern exhibition illustrative of his trip to British Guiana and Venezuela, South America, last February, which was quite interesting, and much appreciated by those present. He showed one hundred slides on dry plates, and explained the pictures as they were projected on the screen. On June 8, a lot of rare slides from negatives by Lieut. Powell, of the U. S. Navy, of Japan, China, and Corea, will be exhibited by the Society

New York, June 4, 1887. SULPHITE.

IMPROVED CAMERA CLAMP AND TRIPOD HEAD.

The well-known tripod screw for securing a camera firmly to the head of a tripod has many disadvantages, which have several times been pointed out. Yet it still continues to be one of the most indispensable articles a photographer has to use.

The object of the device shown in Figs. 1 and 2 of the engraving is to overcome the defects incident to the common screw clamp, by avoiding all separable parts and the wear of the screw thread, and at the same time to permit the camera to be easily and quickly secured to the tripod. A truncated cone shaped casting, having a projection provided with a socket or seat set flush with the top of the tripod head, is secured by screws to the under side of the head. The lower face of the casting is planed or filed off on a bevel. Passing through the hole drilled in its centre is the fastening spindle, having a solid head turned on its upper end, and a thumb actuating disk, held rigidly by suitable screws, at its lower end. The upper face of the disk is beveled to correspond with the bevel on the casting above.



Located in a slot in the spindle is a very light steel spring (see Fig. 2,) which, in pressing against the walls of the hole, holds the spindle by friction, in any position, as it is elevated or depressed, and at the same time allows the spindle to be freely rotated. When the spindle is not secured to the camera, its head is drawn down into the seat in the upper face of the casting, so that nothing will project above the surface of the tripod head.

A light metal plate, having its ends bent up around the sides of the central bar of the camera bed frame, and secured thereto by screws, as shown in Fig. 1, has a key hole slot in which the head of the spindle of the clamp fits. The wood of the camera bed is dug out back of this slot, forming a recess, as shown in Fig. 2. It will be noticed this method of fastening the plate to the camera bed frame secures unusual strength, since the pull on the screws is at right angles to their length. To prevent any possible slipping of the camera after it is secured, a slight depression is provided in the inner surface of the plate at the end opposite the entrance slot, clearly seen in Figs. 1 and 2.

To clamp the camera on the tripod head, it is only necessary to rotate the spindle by the thumb disk until the two beveled faces are parallel with each other, then to push the spindle upward until the faces meet, which leaves the spindle head projecting above the tripod head. When the camera is then set upon the tripod, the head of the spindle enters the key hole slot, and by a slight movement lengthwise the head is brought directly over the seat of the slot. By slightly rotating the spindle by the fingers with the thumb disk, the beveled faces act upon each other like a cam, and at once draw down the spindle head into the seat of the key hole slot, firmly clamping the camera bed to the tripod head. A reverse movement allows the spindle to be pushed up so that the camera may be quickly removed.

It will be observed that the clamp is very simple, effective, and strong, is in fact more durable than a screw, not liable to get out of order, and with it a camera can be very quickly adjusted to a tripod.

The inventor prefers the triangular form of a tripod head, as shown in Fig. 1, and has the tripod legs regidly secured thereto to avoid the wear and racking motion incident to detachable legs, which frequently occurs when photographing in a brisk wind. The fastening for the leg of the tripod is shown in Fig. 3, and consists of a round plate, provided with two projecting ears having a pin riveted between them, which passes through a hole in the extremity of the tripod leg. This construction makes a very rigid and steady bearing for the tripod head and camera. Both may be carried about on the shoulder without in any way straining the clamp.

Different sized cameras may be used on the one tripod head. The improved clamp may be fitted to any tripod head or camera. The inventor, Mr. M. P. Warner, Holyoke, Mass., or the manufacturers, the Scovill Manufacturing Co., 423, Broome Street, New York, are prepared to furnish clamps, and fit them to tripods. Further information may be had by addressing either party.—*Scientific American.*

Patent Intelligence.

Applications for Letters Patent.

8281. William Rogers, 11, Cook Street, Liverpool, for "Registering the exposures of sensitized films as used in roll-holders for photography."—9th June, 1887.

8374. Godefroi Vincent Joseph Poirin, 2, Eardley Villas, Eardley Road, Streatham, S.W., for "Holding photographic films and changing the same, and for holding dry plates."—10th June, 1887.

Patent on which the Fifth Year's Renewal Fee of £10 has been paid.

2156, of 1882. F. Wirth (*Meisenbach*). "Preparation of photographic plates."

Patent on which the Sixth Year's Renewal Fee of £10 has been Paid.

2783, of 1881. C. Sands. "Instantaneous photographic shutters."

Official Abstract of Accepted Complete Specifications.

Riley, 11,175, 1886. "Telescopic standard; folding legs jointed to collar near lower extremity, held extended by catches."

Boult (*Connon*), 6673, 1887. "Cameras (including lenses and lens fittings)." Panoramic camera: turns on optical centre; sensitive surface traversed by mechanism.

Specifications Published.

9160. Joseph Brown, 3, Stanley Terrace, Norbiton, Kingston-on-Thames, Surrey, Artist, for "Improvements in the manner of applying gelatine as a substitute for paper or glass in the manufacture of dry plates for photographic purposes."—Dated 21st July, 1886.

The patentee says:—

My mode of proceeding is as follows. I take a sheet of paper which I coat with a layer of gelatine. This, when dry, I coat with another layer of wax or grease. On this surface I proceed to place a sheet of insensitive transparent gelatine by means of a vacuum. This sheet of gelatine, sufficiently dried on its support, I proceed to coat with a layer of any of the usual sensitive photographic emulsions. This is left to dry, and then cut up to any required size. This prepared gelatine attached to its paper support is now ready to receive the photographic image. I now proceed to develop the image by any of the well known methods. After the image is developed, I proceed to place the photographic image face downwards on a sheet of glass or other prepared surface; when sufficiently dry I take away the paper support and leave the coated gelatine to dry completely; when dry, I lift up the sheet of gelatine, which carries with it the photographic image, and which is now ready to be printed from by any of the usual methods.

3270. James Lauder, of 43, Blessington Street, in the City of Dublin, Ireland, Photographic Artist, for "An improved photographic camera stand."—Dated March 3rd, 1887.

The patentee says—

The camera stand, the subject of the present invention, consists of a vertical framework composed of four uprights or standards of gun barrel or some suitable tubing, held together by frames of the same material top and bottom; each of the standards is provided at the lower extremity with a castor or roller on which the stand runs.

The table or board on which the camera rests is a suspended one, being hung from its corners by weighted cords or chains, the weights running up and down inside the hollow uprights of the frame, whilst the cords or chains pass over sheaves or pulleys mounted at the angles of junction of the framing of the stand, or they may be placed in any convenient position, and if desirable, a less number, both of cords, chains, and pulleys, may be used.

The table is released from its rigid position by gripping in the hand and drawing together two handles, one mounted on each frame, or by some arrangement producing a like result; this movement counteracts the effects of the springs, and the table being reduced in size by this means admits of its being raised or lowered to any angle or position that may be required.

5080. John Jabez Edwin Mayall, of Southwick, in the County of Sussex, Photographic Artist, for "Improvements in the production of photographic impressions."—Dated 5th April, 1887. [*Complete Specification.*]

The patentee says:—

This invention has for its object the production of permanent photographic impressions, whether coloured or uncoloured, on any suitable material. According to this invention, I first take a negative, preferably by electric light, but it may also be taken by sun light in the ordinary way; I then print a positive on paper, porcelain, or other suitable material prepared as follows:—

For paper I soak it in a weak solution of gelatine and lactate of iron in about the following proportions, viz., two grains of fish glue or isinglass to one-sixteenth of a grain of lactate of iron in one ounce of water, the whole being boiled, and subsequently filtered. The paper, after having been immersed for about three minutes in the above solution, is dried and smoothed; this may be done by placing it between blotting paper, and submitting it to a slight pressure. I next float the paper thus prepared for about two minutes on a bath composed as follows:—viz., to about one ounce of albumen (preferably that taken from fresh eggs), four grains of chloride of sodium, half a grain of bromide of potassium, two minims of glacial acetic acid, and one drop of a concentrated solution of some derivative of silex, or of hydrocarbon, of which I have found salicylic acid prepared according to my invention, and for which I intend to apply for letters patent, to be very suitable; the whole must be beaten up into a frothy mass, and allowed to settle for about twelve hours. Any tints may be given to this mass by adding the desired colour solved in a saturated alcoholic solution in the proportions of about one minim of alcoholic solution to about four ounces of the albumen solution above described, and one minim of meconin, or its derivatives; the whole is then beaten up and allowed to settle.

After floating the paper it is then dried by slow heat and ironed on the back to make it perfectly dry and smooth. I then prepare a bath of nitrate of silver and nitrate of soda and free ammonia in the proportions of about one ounce of water to 40 grains of nitrate of silver, 10 grains of nitrate of soda, and three minims of free ammonia, and, when pliability of the paper is desirable, I add to the bath 5 drops of glycerine per ounce of bath solution.

The paper is then floated face downwards on this bath for about two minutes, and then dried in a dark room, after which it is fumigated in an atmosphere of ammonia for from three to five minutes, and is then ready for printing upon in the ordinary way. The prints, after fixing, must be soaked in a weak solution of sulphuric acid to expel any trace of the hypo-sulphite of soda, and well washed. The printed impression in a moist state is then mounted face uppermost on a piece of glass or skeleton frame, and when dried, the desired colours, prepared as hereafter described, are then dabbed on by suitable means and slightly stumped. The dabber which I find suitable for this purpose is a pad of fine cotton wool pushed through a glass tube so as to protrude therefrom, and cut square and even at the end. This cotton wool must either be renewed for each colour, or a separate dabber made as above kept for each colour.

After the colours have been applied the paper is rendered impervious to moisture by having applied to its back and front some such substance as white wax or paraffin or camphor, the print being sufficiently warmed for the purpose of the application of the wax. The colours must be stronger than are required for the final effect.

The picture is then sprayed over or subjected to an atmosphere charged with a weak alcoholic solution of salicylic acid or some derivative of silex or hydrocarbon, paraffin, or of any preparation of fluorine solved in alcohol to set the colour, and then it is subjected to the action of finely-powdered soluble glass. This I propose to effect as follows:—viz., by placing a powdered silicon in a suitably-closed chamber provided with shelves and fitted with bellows so as to blow the silicon powder into a cloud. The coloured picture is then put on one of the shelves to catch the fine dust of the silicon for a very few seconds, after which it is taken out of the chamber. The picture (face downwards) is then laid on a plate of glass coated in the following manner. After having rubbed the glass with a dabber of any suitable material (for which I use a ball of cotton wool covered with leather) charged with powdered silicon, I coat it with collodion to which is added one drop per ounce of salicylic acid, and when dry I recoat it with gelatine and salicylic acid in about the proportions of one drop of acid to one ounce of gelatine, and again dry the plate. The surface of the print must now be moistened with some hydrocarbon such as paraffin or kerosene in solution, to which is added a few drops of salicylic acid in the proportions of about two drops of salicylic acid to the ounce of hydrocarbon, and, when sufficiently moist, the picture is well pressed down upon the gelatine surface and allowed to dry in a warm atmosphere, after which it is stripped from the glass, and when mounted on card, porcelain, or other desired material, produces a permanent and finely-coloured photographic picture.

If it is desired to have a brilliant picture it is necessary that the entire process above described should be conducted without any delay or intermission in the various portions of the process, and in an atmosphere of increasing temperature, as if in the process the print is allowed to become chilled a dull appearance is the result, which dull appearance may, however, be sometimes preferred.

For printing on porcelain and such like material I coat the material with collodio-chloride of silver, or carbon tissue, or the albumen solution above described, the subsequent treatment being the same as that already described for paper.

For the production of uncoloured photographs the process is similar to that above described, omitting the colours.

The colours I employ are ordinary colours in a dry state ground up with phenic acid, and silicate of potash or kerosene, and silicate of potash in alcohol in about the following proportions, viz., one ounce of dry colour to 60 grains of phenic acid, and 20 minims of silicate of potash, or 60 grains of kerosene to 20 minims of silicate of potash. In the above manipulation care must be take to exclude all organic matters other than what are above described.

Patents Granted in America.

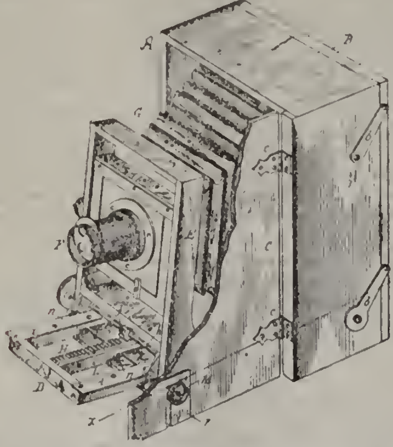
362,599. Thomas H. Blair, Boston, Mass., "Photographic camera."—Filed Jan. 28, 1887. Serial No. 225,789. (No model.)

Claim—1. The combination with a camera opening in front and provided with a frame on which the lens is advanced or withdrawn, of a hinged cover arranged at the side of said frame, and a locking device connecting said cover in its open position to said frame, substantially as set forth.

2. In photographic cameras the box A, provided with the swinging cover C, slotted at *m*, in combination with an extension frame D, carrying the lens standard E, with its lens F, and the rod *l*, with its locking-nut M, all co-operating substantially as stated.

3. The lens-standard E movable upon a frame, the frame D, with its piece L, and the pivotal plate K, to which said frame is hinged, in combination with the box A, the swinging cover C, locking-nut M, and transverse rod *l*, pivotally attached to the frame D, and which serves to lock the latter in any desired position, substantially as described.

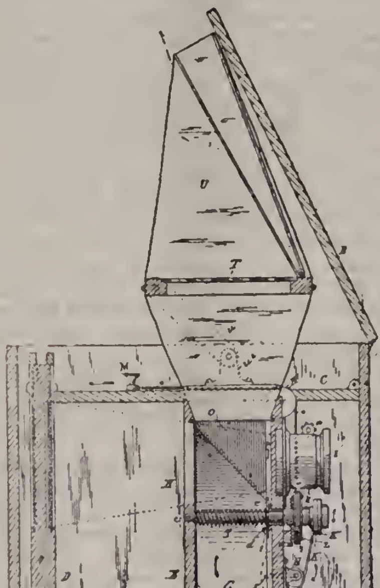
4. The lens-standard E, its pinion *f* and rod *h*, the frame D, with its rack H, and recesses *n n n*, in combination with the swinging rod *l*, pivoted to said frame and locked with the cover C of the camera box by the nut M, as and for the purposes set forth.



5. In combination, the box A, with its focussing-glass *a*, and swinging cover C, the lens-standard E, connected by the bellows with said box and mounted upon the frame D, the pivotal plate K, uniting said frame to the camera box, and the rod *l*, with its locking-nut M, all operating as herein stated.

6. The combination with the camera-box, its hinged cover C, the rod L, its nut M, and frame D, of the plate K, pivotally secured to said camera-box, and provided with the spring *j*, and catch *k*, which engages said box, substantially as herein described.

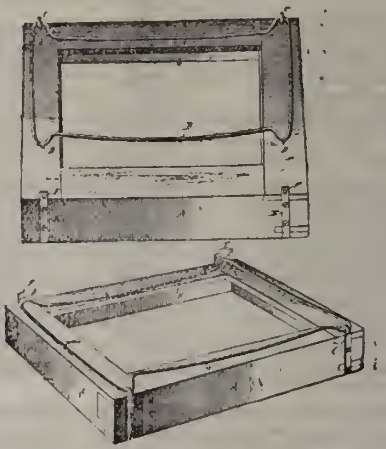
361,673. Walter Clark, New York, N.Y., for "Photographic camera."—Filed November 18, 1886. Serial No. 219,222. (No model.)



Claim.—1. A photographic camera provided with a vertical revolving drum, revolving at right angles to the plane of the lens, for carrying the focussing-mirror, as herein described and for the purposes specified.

2. In photographic cameras, the friction-disks K K′, in connection with the forked arm R and its operating mechanism, substantially as described and shown.

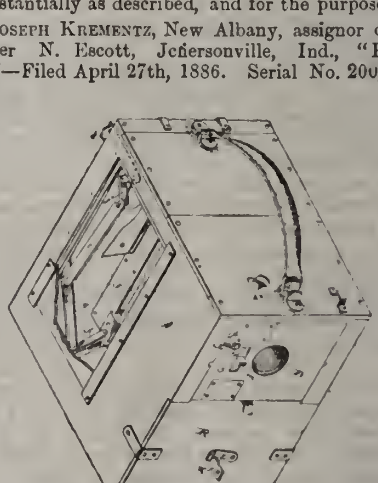
363,209. Giles H. Chesebro, Toledo, Ohio, "Photographic printing frame."—Filed Feb. 1st, 1887. Serial No. 226,201 (No model.)



Claim.—1. The combination with the printing-frame of a quadrilateral wire frame loosely hinged on one side of said frame and provided with spring hasps on the opposite sides, and with sides bent convexly downward, all substantially as described.

2. The combination with the frame A, and the hooked hinges C, secured to one side thereof, of the wire frame B, loosely engaging the loops of said hinges and having its sides bent convexly downward, the spring-clasps E, secured to said frame A, and the catches D on the frame B engaging said clasps, substantially as described, and for the purpose specified.

362,978. Joseph Krementz, New Albany, assignor of one-half to Walter N. Escott, Jeffersonville, Ind., "Photograph camera."—Filed April 27th, 1886. Serial No. 200,366. (No model.)



Claim.—1. In a camera, an upper and a low compartment and a plate-holding box arranged within the lower compartment, combined with a plate-holder carrier, *e f g i j k*, adapted to engage the plate-holders in such box, and present their plates for exposure in the upper compartment, and thereafter return them to the plate-holder box without moving the camera, substantially as described.

2. A camera having a lower compartment provided with horizontal slideways and vertical guides, combined with a movable plate-holder box fitted in said slideways, brackets *e*, arranged to operate in said guides, arms *f*, levers *g*, rods *i*, crank-shaft *j*, and lever *k* co-operating with said brackets to take a holder from the box, expose it in the upper compartment, and thereafter return it to the box, substantially as described.

3. The combination, with the plate-holder carrier having brackets *e*, of the plate-holders having projections *d* to engage said brackets, substantially as described.

4. In a camera, a snap-shutter pivoted at its lower end, combined with a slide, a toggle-lever connecting the slide and shutter, a spring acting upon said shutter to hold it shut, and a catch engaging the slide to hold the shutter open, substantially as described.

Correspondence.

THE PROFESSED PHOTOGRAPHY IN NATURAL COLOURS.

Sir,—The unfounded nature of the pretensions of the Cellerier Syndicate to "Photography in Natural Colours" having been exposed, it might seem unnecessary to discuss the matter further, but for the suggestion that their productions might be entitled to be called "Photographs in Colours," and that such a name would not be false and misleading. In reply to this suggestion, I submit—1st, that photographs coloured by the Cellerier or any similar process of hand-painting are *not* "Photographs in Colours;" and 2nd, that the expression "Photographs in Colours" is, and always has been, understood by the public to mean that the colours have been produced by photography, and not by the painter; 3rd, that therefore to call the Cellerier or any other similar productions "Photographs in Colours" is just as much a misstatement, and just as much calculated to mislead the public, as the title they put forward, "Photography in Natural Colours."

1. In the Cellerier process the photograph is an ordinary autotype or carbon transparency. The application of the colours is a separate process depending upon the judgment of the painter in selecting the colours, and his skill in applying them to the places where he desires to produce his effects. The result is a coloured photograph, and no more a photograph in colours than a hand-painted lithograph is a chromo-lithograph.

2. I suppose that there are few photographers of any lengthened experience to whom the remark has not been occasionally addressed by one of the public, "I suppose the next thing will be that you will be able to take photographs in colours." Whatever the reply may have been, the idea existing in the minds of both speaker and photographer has been that photographs in colours mean pictures in which the monochrome of actual photography shall be substituted by a coloured image, not that a monochrome image is to be coloured by a painter; and this idea is a perfectly just one.

It happened some time ago (perhaps a year and a-half or two years since) that a gentleman of my acquaintance who had been connected with public companies, called upon me to ask my opinion respecting a process in which he thought of interesting himself, and which had been introduced to him as a process of taking photographs in natural colours. He obtained and sent me the specification (Cellerier's), and at our next interview I gave him my opinion, which is and was, that to introduce such a process as photographing in colours would be quite as unjustifiable as to supply cotton under the name of silk, or brass as gold. My friend of course replied that he would have nothing to do with such an affair. The process has, however, found investors or supporters who have not scrupled to bring it out with the misrepresentation that has justly been condemned in the photographic press.

"It must be true—it's in the papers," is an old saying which represents the feeling engendered in the public mind by statements, some quite recent, in journals claiming to be leading organs of public opinion as to the new era said to be now instituted in photography by the discovery of processes for producing photographs in natural colours. It is not easy to convince the public of the fact that these statements, however they may conduce to the pecuniary interest of certain people, have not a vestige of truth in them. To the honour of the *Standard*, among leading newspapers, it may be said that it is not amenable to the influences which can procure the insertion of paragraphs of the nature referred to. Will not the proprietors of other leading newspapers see the desirability of sifting such matters so far as their own columns are concerned, and of taking means to prevent for the future their influence being used for the purpose of disseminating misrepresentation for the benefit of commercial speculators?

W. E. Debenham.

Dear Sir,—I am obliged to you for publishing my letter of last week. I may state that at the next Board Meeting of the Syndicate I brought to your notice expressions of opinion as to the meaning of "photography in natural colours," and at once, without the slightest hesitation, the Board gave instructions to withdraw and discontinue any such heading to their processes (Cellerier and Parkes), as they do not wish to adopt any name of a possibly misleading or deceptive character, feeling assured that the results of the Cellerier-Parkes invention will justify the high encomiums and good opinion of the press and the public, already so generally expressed, without any distortion of words or undue puffing.

As I have before explained, there is no desire for secrecy or deception. The Syndicate are quite prepared to protect their patent rights. Since the press invitations were sent out considerable progress has been made in developing and perfecting the processes. The flesh tints are more evenly and clearly portrayed, and the colours are rendered more effective and striking. The Syndicate have no wish to state anything incorrect, but are only anxious to convince the public that the Cellerier-Parkes process is a genuine undertaking; and, as you kindly anticipate, "there is certainly a prospect of the Syndicate doing a large and remunerative business."

The Syndicate will, at all times, notice with satisfaction any advice or assistance rendered by your valuable paper.

Thanking you for the candour of your expressions, especially when you are pleased to say that "the average excellence of the photographs themselves is high, and the colouring is, on the whole, equal, and perhaps superior to that of other collections of photos coloured by analogous means, and that in many instances the work of colouring is really of high merit,"—I am, dear Sir, yours faithfully,

E. W. Parkes.

Cellerier's Syndicate Limited, 16 *and* 17, *Poultry, E.C.*
14 *June*, 1887.

Sir,—It is satisfactory to see that you have pointed out the distinction between "Photography in Natural Colours" and "Photographs in Colours." It may be possible by the aid of quibbling to argue that a photograph coloured by any artificial process is an example of "photography in natural colours," but it is very clear that this latter phrase is understood to apply to one thing and one thing only.

It is scarcely to be supposed that the Cellerier Syndicate, when they advertised "Photography in Natural Colours," and printed prospectuses having this title, did not know what construction the public would place upon their announcement. If the Syndicate imagined nobody would infer that the long-sought-after secret had been revealed, then they must be much more simple than we would gather from their letter published last week.

Anyway, as one who interpreted the phrase "Photography in Natural Colours" in its legitimate sense, I called at one of the Syndicate's establishments. I asked to see some samples of "Photography in Natural Colours," and was shown specimens, which I am bound to say were not remarkable. But whether they were good, bad, or indifferent, did not matter—the important point was the process. I said to the attendant, "Are these colours produced direct in the camera?" "Oh, no!" was the reply, "the colouring is done in the printing. The great advantage of this process is that the photograph can be washed." "Well," I said, "if I were to bring you a photograph, could you colour it by your process?" "No, that could not be done." "It would have to be copied and printed afresh?" "Yes." And again the attendant enlarged upon the immense improvement in being able to wash the colours.

I have nothing to say against this explanation. It was honest, which is more than can be said of the advertisement; but, naturally, it was not what I expected. I felt I had been induced to visit the place under false pretences.

True, I had learned the important fact that the colours would wash, but that did not compensate me for my disappointment. The process may or may not be a valuable one, but it is very certain that the way it has been launched is likely to do it more harm than good.—Yours obediently,
Charles E. Pearce.

Sir,—As a professional portraitist, permit me to tender to you my thanks for the unmistakably strong position your journal has taken up regarding what has been recently called "Photography in Natural Colours."

You, sir, and perhaps all of the readers possessing a technical knowledge of photography, would look for such a startling discovery in some other channel than that of the advertising columns of a dozen or so newspapers; but the public are not posted in such matters. Hence photographers hail with pleasure the weapon you have placed in their hands—the articles in the two last issues. Armed with these there need be no difficulty whatever in answering, upon very good authority, questions relating to the misleading title adopted by the Cellerier Syndicate.

For their own sake, and the honour of photographers as a class, I trust the manager of the concern will lose no time in rectifying his grievous error.—Your faithfully,
W. M. Ashman.

Dear Sir,—If, as you say in your article last week, the mere conjunction of colour with a photograph cannot in any sense be regarded as photography in colours, why should the result produced by such means be entitled to the term "photograph in colours?"—Faithfully yours,
Photo Club, June 15th, 1887. A. Cowan.

THE NORTH SURREY PHOTOGRAPHIC SOCIETY.

Dear Sir,—Will you kindly allow me to make known through your journal that a novelty will be introduced at the next meeting of the North Surrey Photographic Society which will no doubt result in an interesting discussion. Members and non-members are invited to bring their photographic outfits ready for field work, for the purpose of comparing and discussing the merits and demerits of their apparatus. The meeting will be held at the Greyhound Hotel, Dulwich, on Wednesday, June 22, at 8 p.m.—Yours faithfully, Harold Senier, *Hon. Sec.*

Proceedings of Societies.

Photographic Society of Great Britain.

The last ordinary meeting of this Society for the session was held on Tuesday last, the 14th inst., at the Gallery, 5a, Pall Mall East, **James Glaisher**, F.R.S., President, in the chair.

Minutes of the previous ordinary meeting having received confirmation, the following gentlemen were elected members of the Society:—Hon. Reginald Dudley Brougham, Sir Coutts Lindsay, Bart., and Octavius Smith.

Dr. **Edgar W. Crookshank** then read a paper on "Photo-Micrography and its value in Biological Research."

The lecturer, in opening, stated his reasons for using the term photo-micrography in contradistinction to photo-microscopy, and others, more or less analogous. He then briefly scanned the work achieved by early experimenters in this practically inexhaustible field of research. The primitive eyepiece and pyramidal camera were also contrasted with the more complicated machinery of recent introduction. It was in working with high powers that the microscopist found photography of so much value in his work, for no one would deny the accuracy of its delineations, and results now showed that observers, even when clever with the pencil, did not always give representations of certain objects which were in every respect reliable. Reference was then made to photographs of sections published in 1877 which were stained with aniline dyes, and it was found that those of a brown hue yielded satisfactory images. The value of eosin in collodion having been alluded to, and that other experimenters found a similar effect to take place when brown had to be photographed, whilst other colours in which aniline dyes had been employed were imperfectly active, the lecturer passed on to the subject of isochromatic plates, which he said marked a distinct period in the progress of the study. Considerable advantages were derived by suitable screens interposed, and the introduction of chromatically prepared plates seemed to obviate most of the former difficulties. The lecturer then very minutely described all the details connected with an efficient apparatus built by Swift and Sons, an account of which, and somewhat similar arrangements can be found in volume xxviii. of the News (see also I. H. Jennings' series of articles, "How to Photograph Microscopic Objects," same volume.) The lecturer advised the proper correction of lenses for chemical and visual focus; but when using lenses not so corrected he found it convenient to rack out the tube until a sharp image in the negative was secured, and the distance required was then noted. The illumination of an oxy-hydrogen lantern he preferred to all others, and gas bottles were said to be more convenient than bags. Several examples of difficult subjects necessitating the use of high powers were handed round for inspection, in some cases an amplification of 4,000 diameters being obtained. One of these was a distinct representation of organisms found swimming about in liquor sanguinis among the corpuscles of the blood of an Indian rat. Easy transmission by post was also stated to be an argument in favour of photo-micrographic representations.

The **Chairman** inquired whether the members desired to make any remarks upon the able lecture they had just heard from Dr. Crookshank.

W. M. **Ayres** was of opinion that the lecturer had omitted to do due justice to the investigations carried on by the late Dr. Maddox. That gentleman used to employ stain for the sections of brain and other subjects. They were afterwards photographed by means of a lantern, and magnificent results obtained. He (the speaker) had many times been engaged until early morning assisting Dr. Maddox in his work.

The **Lecturer** replied that in a paper such as the one read, it was quite impossible to do full justice to everybody; but, for Mr. Ayres' especial information, he would again read over the names, and it would be found that he had taken care to mention that of Dr. Maddox.

W. M. **Ayres** observed that the name of Maddox should have been foremost.

Dr. **Crookshank** said that it was only courtesy to place foreign microscopists first on the list, and this he had done.

W. E. **Debenham**, referring to the method mentioned in the paper for ascertaining when a lens is not true to focus, and the plan of correcting it, said, that instead of turning the lens a little inwards or a little outwards in order that a proper correction be obtained, he should suggest that the camera be fitted with a swing-back, and if the plate was very much swung, an idea would at once be obtained how much it would be necessary to alter the focus.

G. L. **Addenbrooke** considered it more simple to focus the image, and observe the sharpest points.

J. A. **Harrison** alluded to certain facilities presented by the Pantascopic Camera for such work. He explained that the slit which moved along the entire field enabled an approximate focus to be easily made.

Dr. **Crookshank** said he did not think any method answered so well for high power objectives as that of having the lens once for all thoroughly corrected.

T. E. **Freshwater** remarked that the photographs shown of the organisms were correct reproductions of the originals he saw at the Royal Microscopical Society's meeting.

The **Chairman** asked for a vote of thanks to Dr. Crookshank for his lecture, which was accorded.

The **Chairman** announced that the 21st of September is the last day for receiving exhibits, and on Saturday, October 1st, the Exhibition will open with a soirée. The judges selected are three members of council—W. Cobb, W. F. Donkin, W. England, and three members of the Society—F. Hollyer, E. Mendelssohn, L. Warnerke. Four judges of apparatus have been selected: W. L. Addenbrooke, T. Bolas, J. Cadett, H. Trueman Wood. The council have revised the rules of the Society, a draft of which will be posted to every member in a few days; and, on July 19, a special general meeting will take place to discuss the proposed alterations.

A large collection of instantaneous studies of animals and birds were next exhibited, these being the work of O. Anschüt, Lissa, Posen.

The proceedings then terminated.

London and Provincial Photographic Association.

A meeting of this Society was held on the 9th inst., L. Medland in the chair.

W. H. Prestwich spoke at length upon a new form of electric motor, designed by A. J. Jarman. In concluding, he invited the members to inspect the same in action at Jarman's Works, Brixton.

The Chairman related an experience of following the instructions laid down in a guide to exposures. As a result his negatives were enormously over-timed.

Dextrine then formed a subject for discussion, in which opinions varied regarding the properties possessed by pale and deep-coloured samples. As a mountant of photographs the yellow was preferred by one speaker.

T. Berry had photographs mounted with this substance at least fifteen years ago which had not changed.

E. Clifton remarked that an excellent sample of American manufacture was now sold at 2d. per pound, and it is largely used in the book trade.

W. H. Prestwich inquired the best means of mounting prints in a book.

E. Clifton found that by spreading a thin film of mucilage of acacia over the surface, and mounting by means of a paper-knife, buckling did not occur. This was attributed to the small quantity of water present.

Yellowing in the lights of bromide prints was next referred to, and some were of opinion that imperfect fixing was a cause; others that the whole of the iron salts were not eradicated.

J. B. B. Wellington enquired the best means to stain the lights of a platinotype yellow, so as to reproduce an old print?

Coffee, annatto, and other dyes were suggested.

T. Berry used dilute permanganate of potash solution, which, by continued action, would give a brown colour if desired.

W. H. Harrison remarked that this method would be quite permanent. Aniline dyes would not.

The Hon. Secretary announced that the Convention would be opened at Glasgow on the 4th prox. by the Lord Provost.

Photographers' Benevolent Association.

The Committee held a meeting on the 9th inst., when H. Kuntzen, C. J. Cowie, F. J. Goode, W. Ingle, R. W. Goodden, T. Charters White, W. H. Walker, J. Jackson, H. E. Davis, J. Martin, G. Aspinal, E. Hooper, A. J. Wallace, J. G. Bryan, C. J. Parker, W. Ward, J. R. Jones, J. H. German, and A. Gandy were elected members.

An application for assistance was then dealt with, and the sum of £6 granted the applicant.

Secretary reported that J. Chester Jervis, winner of £3 3s. prize, and Alfred Green, winner of £1 1s. prize, given by the "Amateur Photographer," had made donations to the Association of those amounts.

Perken, Son, and Rayment, and "S. B.," had also contributed a guinea each to the funds.

Employers willing to assist the Committee in their work are desired to write the Secretary for a supply of hand-bills for distribution amongst their employés.

Camera Club.

At a meeting on Thursday, 9th June, W. H. Hyslop in the chair, an exhibition was given by J. M. Brownrigg of a set of lantern slides made from negatives taken during a recent tour in Switzerland and Italy.

Previous to the slides being shown, the Hon. Sec. drew attention to some pictures (to be seen on the Club walls) lent by T. Bolas, one a collotype print in a great variety of colours, and the others, photographs by F. C. Beach, of the *Celtic*, showing the effects upon that vessel of her recent collision with the *Britannic*.

Mr. Brownrigg's transparencies, including some fine photographs of interiors and statuary taken under difficulties in the galleries of Rome and Florence, also pictures taken at Capri, Alpine scenery, and a humorous set in caricature of scenes from Romeo and Juliet. The gem of the collection was a picture representing sunset over a broad expanse of water.

On Thursday, 23rd June, at 9 o'clock, another exhibition of lantern slides will be given. Slides will be contributed by J. Gale, J. B. B. Wellington, J. M. Brownrigg, C. B. Wright, and other members and friends. The next Club excursion, to Marlow and neighbouring points upon the river, is fixed for Saturday, 25th June.

North Surrey Photographic Society.

The usual fortnightly meeting of this Society was held at the Greyhound Hotel, Dulwich, on Wednesday, June 8th, F. E. Harding in the chair.

After the usual business, C. Eskell read a paper on collotype printing. He described the use of the principal apparatus necessary, and explained his method of making collotype prints.

C. Eskell gave simple formulæ for substratum and sensitive coatings for the ground glass plate, and stated that there need be no difficulty in any amateur working the process at a moderate cost; the whole of his outfit was obtained at a cost of about £8. Some very good examples of collotype printing, executed by C. Eskell, were passed round.

At the meeting on June 22nd, at 8 o'clock, members are invited to bring their photographic outfits ready for field work, for the purpose of comparing the merits and demerits of the various parts of their apparatus. Matters relating to field work generally will also be discussed.

Non-members are also invited to attend this meeting, bringing their apparatus with them.

North London Photographic Society.

At the meeting held at Myddelton Hall, on June 7th, J. Traill Taylor in the chair, J. T. Blomfield, H. Coppin, A. P. Higgins, J. Jackson, and W. H. Walker were elected members.

A large number of views and groups taken at the excursion to Chiddingstone and Epping Forest were exhibited.

The President showed and explained the working of an American detective camera made by the Scovill Manufacturing Company, having a very quick-acting lens made expressly for it by Wray. He also exhibited the Grimston shutter and another.

L. Medland showed a shutter which could be regulated to give exposures from one-fiftieth of a second.

In a short discussion upon the development of gelatino-bromide papers, it was stated that the secret of producing velvety black shadows in the pictures lay in the use of old ferrous oxalate developer. After use the developer should be placed in a bottle and exposed to sunlight, a little citric acid being added before again using.

A. Mackie said that he had been frequently congratulated recently by non-photographic friends on the success now achieved by photography in natural colours. He had had to explain that we are, in that direction, very little in advance of the photographers of thirty years ago. The President would perhaps tell them something about the colouring processes of which they have heard so much lately.

Mr. Taylor then gave a detailed account of the Cellerier process of colouring photographs, so far as could be ascertained by him from an inspection of such as had been submitted to him for that purpose. It was, he said, merely a process of applying colours at the back of a transparent print, such as most of them had long been acquainted with.

In consequence of the third Tuesday in this month being the Jubilee day, the next meeting will be held on Friday, the 17th instant, when E. Dunmore will deliver a lecture on "Photography, Past and Present." Visitors are invited.

Leicester and Leicestershire Photographic Society.

The first excursion for the present session took place on the 9th inst., when sixteen members and friends proceeded to Stoneleigh Abbey, the seat of Lord Leigh, over which the party were courteously conducted, and after admiring the quaint old relics, the statuary and pictures, some of the party unlimbered their apparatus and exposed on the ivy-grown walls of the Abbey which constituted the older portion of the fabric, affording several excellent negatives. Kenilworth Castle was then visited, and the ruins were focussed from almost every aspect, some splendid negatives resulting. The contents of the dark-slides being exchanged, the party then proceeded to Warwick Castle, where they were reinformed by several additions to their party, and, provided by the forethought of Mr. Tucker with a pass, the party were admitted to the interior of this grand old castle, where some immediately proceeded to take advantage of the favourable light, some preferring to do the interior in a tourist rather than a photographic sense. After about two hours spent in and about the castle and grounds, the apparatus were packed, and the party left for home. In the aggregate, sixty-seven plates were exposed, ranging in size from quarter-plate to 12 by 10, resulting in an excellent average of successful pictures.

Birkenhead Photographic Association.

The ordinary monthly meeting was held in the Free Public Library on the 9th instant, the President, J. A. Forrest, in the chair.

A. Pemberton was elected a member.

A circular was read from the Secretary of the Royal Meteorological Society, relative to photographing lightning flashes. None of the members had ever attempted this sort of work, but, the matter exciting some interest, it was felt that it should be tried the first opportunity. The photographing of lightning does not present any particular difficulties. If a rapid plate and an ordinary rapid doublet with full aperture be left uncovered at night during a thunderstorm for a short time, flashes of lightning will, after development, be found in some cases to have impressed themselves upon the plate. The only difficulty is the uncertainty whether any particular flash will happen to have been in the field of view; this, however, can easily be obviated by using a suitable meter.

A number of specimens of ceramic photography from the potteries of Sampson Bridgwood and Son, Staffordshire, were exhibited and much admired, especially so several which had been hand-coloured. The firm print from members' own negatives, and their price is not excessive, considering the difficulty and indestructibility of the work.

After some conversation on the approaching Conference, and the desirability of having a representative from the Association there, it was agreed that the President be the one selected for the honour, the Association disbursing a part of his expenses.

F. N. Eaton had an exhibit, interesting to those photographers who study ways and means, of a number of developing trays made by himself from ordinary brown paper, put whilst wet on a wooden block of the required shape, and then when dry painted and varnished; their cost is almost *nil*, and to the tourist disliking travelling *impedimenta* they would be invaluable, owing to their almost feather weight.

The chief attraction of the evening was a lantern exhibition, entitled "Glimpses of Picturesque Italy," by G. E. Thompson. To carry this out, the windows had been blocked up with brown paper to keep out the sun, which was then shining in full vigour. This was Mr. Thompson's second visit to Italy with the camera, and resulted in a number of new places being brought before the Association that had not been seen before. Some three hundred views in all were taken, and the exhibition consisted of about half of these, and included Naples, Vesuvius, Capri, Amalfi, Venice, Milan, Pisa, &c. Mr. Thompson used quarter-plates throughout, which experience had taught him was the proper sized camera for a lengthened tour. His slides being all printed by contact, they showed every variety of colour—black to rich sienna brown, as most suited to each particular view; the latter tint, it was explained, being obtained by using the developer *cum grano salis*—Cowan's formula with a pinch of salt added.

Talk in the Studio.

Photographers are familiar with the name of Jarman, as that of an early and careful experimenter in gelatine emulsions. They will also remember the convenient arrangement of primary batteries brought forward by him some few years since for electric lighting for photographic purposes. "Jarman's Electric Tramcar" is the latest development of its producer's labour in the field of electricity, in which he is perhaps better known even than in photography. On Monday last, a party of gentlemen assembled at Jarman's electric works in Brixton, to witness the trial of this car. Lines had been laid down in the somewhat spacious yard, including an incline and a pretty sharp turn. The car appeared to answer admirably to the control of the driver, and, so far as could be judged, everything worked satisfactorily. It was stated that a trial trip to Westminster Bridge had been made during those hours of night or early morning for which alone it is at present possible to obtain the necessary permission, and that including two runs of a hundred yards upon a macadamised road.

Photographic Club.—The subject for discussion on June 22nd will be "Aids to Exposure." Saturday outing at Waltham; train leaves Liverpool Street at 2.15. June 21st, Amalgamated Club and Society outing at Watford; train from Euston at 10.10.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Wm. G. Honey.—The specimens have been returned, and we remember them. Of course, we cannot say whether any point relating to their production is patentable without knowing a great deal more.

Foreign Subscriber.—It is well to add a little sulphuric acid or citric acid—say half a drachm of the former, or two drachms of the latter, to each quart of the solution; but if the oxalate is alkaline to start with, more acid should be added. In other words, neutralize the oxalate until it does not affect litmus paper, and then add the above dose of acid. Should there be any deposit, let it settle, and pour off the clear liquor.

Preserver.—1. A citric acid bath is used, on which the paper is floated back downward; a perchloric acid or potassium nitrate bath may be used in a similar manner. 2. The method with mercuric iodide and Schlippe's salt, as recommended by Debenham.

Nitrate.—1. There is no necessity to use hot water, as the salt is very easily soluble in cold water; indeed, hot water may cause partial decomposition. 2. Paper is ordinarily far too much contaminated with materials other than cellulose to be usable with advantage for the purpose; but that paper sold at the chemical apparatus stores under the name of "Swedish filtering paper" will serve your purpose very well.

M. M. Jones.—1. The third on your list is the one which we should select for our own use. 2. Rather more water should be added, but not so much as to prevent the mixture gelatinizing when it cools. 3. If a red colour appears, it is a sign that too much has been added.

An Angry Member.—1. The solecisms of style show the whole series to be concocted by the same person, and, moreover, by an individual who has excellent reason to be ashamed of adding his name to the production. The whole affair is a misrepresentation by an impudent character. 2. Write to the Council or bring the matter forward at one of the meetings. We will write to you privately.

Emulsion.—Minute traces of greasy matter.

G. R. M.—With the stop you mention, and under average conditions of sunlight about three o'clock, one second would probably be about the mark.

H. Walker.—1. The single lens gives slight distortion, straight lines at the margin bulging out towards the middle. 2. Very good indeed; but a somewhat darker background might have been an advantage.

J. C. O.—Even when iodine alone is used, the sensitiveness will vary much according to circumstances; but as a rough estimate we should say nearer a hundred times than fifty.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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ON PHOTO-BROMIDE AND PHOTO-IODIDE OF SILVER.

BY M. CAREY LEE, PHILADELPHIA.

PHOTO-BROMIDE OF SILVER.

THIS substance is formed for the most part by the same reactions as the corresponding chlorine salt.

It is not, however, to be supposed that all reddish-brown substances resulting from the action of reducing agents on silver bromide are the photo-salt. By reduction $AgBr$ may yield a brownish coloured form of silver, which, mixed with unreduced $AgBr$, may form a substance resembling the photo-salt, but having none of its properties. The two are easily distinguished by the action of cold nitric acid, which, added to a brown mixture of $AgBr$ and Ag, quickly dissolves the silver, leaving $AgBr$. On the photo-salt it has no action.

A beautiful variety of photo-bromide is easily obtained by dissolving silver nitrate in ammonia, and adding it to ferrous-sulphate previously mixed with solution of soda. Then KBr is added, dissolved in dilute sulphuric acid, until the mixture has a strong acid reaction.

Sometimes this method gives immediately a fine purple, sometimes a brown product; but in either case, after washing and cautiously heating with dilute nitric acid, a beautiful purple results. Much care is needed in the nitric acid treatment, or particles of yellow bromide will form.

A specimen obtained in this way gave figures indicating 7·25 per cent. of sub-bromide. Each specimen, however, varies in composition, often very materially.

I subsequently found it desirable in some degree to vary the method, and to determine the best proportions in which the materials were used to obtain a constant product. That which I prefer to use is as follows—

Six grammes of silver nitrate are to be dissolved in 200 centimetres (cube) of water, and ammonia added until the precipitated oxide re-dissolves easily. Twelve grams of ferrous sulphate are dissolved in 200 c.c. of water, and the silver solution is poured into this. Then four grammes pure caustic soda dissolved in 50 c.c. of water are added, let stand a few minutes, then five grammes of KBr dissolved in a little water. Finally dilute sulphuric acid until the whole has a strong acid reaction.

This product, well washed, and then heated cautiously with nitric acid (1·36) diluted with five times its bulk of water, gives photobromide of a shade of royal purple extremely beautiful.

Notwithstanding its fine colour it proved to contain but little sub-bromide, not quite one per cent. (0·98).

Various other methods may be employed. Silver bromide may be dissolved in ammonia and treated first with ferrous sulphate, and then with dilute sulphuric acid. This method, which is very good with the chloride, is less available for the bromide, because of the less solubility of the normal bromide in ammonia, so that although the product is good, it is small in quantity.

Very good results are obtained by dissolving silver phosphate, nitrate, and, probably, almost any other salt of silver in ammonia, adding ferrous sulphate, and, after two or three minutes, hydrobromic acid.

Potash bromide and cupric sulphate may be made to act on metallic silver in fine powder, but the product is contaminated with much copper, difficult to get rid of.

When $AgBr$ is treated with sodium hypophosphite a brown or brownish purple form of photo-bromide is obtained, which seems to be more easily decomposed by nitric acid than most other forms of this substance.

Potash or soda with oxidable organic substances, made to react on silver nitrate and then treated with HBr, gives the photo-bromide. With soda and milk—sugar or aldehyde—a rose-coloured or pink product is generally obtained.

Reactions.—In strong solution of potassic iodide it dissolves, and this solution, by dilution, lets fall pale yellow normal bromide. With a weaker solution it becomes somewhat lighter in colour.

With acid ferric sulphate there is no action in the cold; but with a few minutes' boiling the photo-bromide is converted into bright coloured normal bromide.

In sodium hyposulphite it dissolves, leaving a little black residue of silver.

With ammonia, the action at first seems slower than is the case of the corresponding chloride, and, if the ammonia is poured over the photo-bromide in small quantity, it may seem to be without effect; but the photo-bromide, shaken well up in a test tube with a large excess of ammonia, is almost instantly blackened.

Exposed to light, the red shades of photo-bromide darken with great rapidity. Placed alongside of the corresponding chloride, the contrast is very striking. A strong image forms on the bromide long before anything appears on the chloride; nevertheless, if these two films are thrown into a developing solution, the chloride, on which nothing could be seen, gives a vigorous positive development, while the bromide, which already showed a strong positive image, develops a negative one. The details of this reverse development have been already considered in another paper.

As respects the direct effect of light unaided by development, the contrast between the action on the normal haloids and on the photo-salts is very striking. If a rose-coloured photo-bromide and some normal bromide are exposed side by side, the normal bromide (formed in presence of excess of alkaline bromide) darkens, but very slowly, while the photo-bromide is quickly acted on. I have seen deep purple photo-bromide change to brown all over its surface with less than five minutes' exposure to diffused light in the middle of a room, an amount of exposure which would scarcely have produced a visible effect on normal bromide formed in presence of excess of KBr.

When photo-bromide is exposed to the spectrum, it shows the same difference in sensitiveness, and darkens more rapidly than photo-chloride; but it gives little indication of colour.

When exposed under coloured glass, photo-bromide gave distinct indications of reproducing colours, but much less favourably than photo-chloride. Under green glass, it became bluish; under blue, greenish; under yellow glass it bleached, and under red glass the red of the photo-bromide remained unchanged.

Photo-Iodide of Silver.

The most characteristic colour of this substance seems to be a fine rich purple. It is obtained in much the same way as the corresponding chloride and bromide, with this limitation: that an excess of alkaline haloid must not be present, as the photo-iodide is quickly destroyed by it. The iodine salt differs much more from the bromide than does the bromide from the chloride, and two striking distinctions are, its easy decomposition by its own alkaline salt, and its action with ammonia, as will appear beyond.

A very easy and satisfactory method of obtaining the photo-iodide is the following. Silver is to be reduced from the nitrate or chloride in fine powder in any convenient way; I have usually employed Levol's method. To a solution of potash, iodine is to be added until the liquid becomes almost black. This iodine solution is to be diluted, and poured over the silver by degrees, keeping the silver constantly agitated, until the whole mass becomes clear bright purple.

Any excess of silver present may be removed by boiling with dilute nitric acid, but this operation requires far more circumspection than in the case of the corresponding chlorine and bromine products. The acid (1·36 was used) must be diluted with twelve or fifteen times its bulk of water, and the boiling must be very short, otherwise the photo-iodide is converted into normal yellow iodide.

Another method by which it may be obtained is to add ammonia to silver nitrate in considerable excess, and to pour this into solution of ferrous sulphate. Potassic iodide is dissolved in very dilute sulphuric acid, and added till the mixture has a sharp acid reaction. It is necessary to observe that the KI must be added somewhat short of a proportion equivalent to that of the silver. Any excess of silver may be removed in the manner already explained.

Different specimens of the purple product in this way obtained gave various amounts of Ag_2I from 0·64 per cent. to 4·63. The same remark made as to the meaning of these determinations in reference to the other haloids applies to this.

The method of roasting silver oxide until it is black, and acting on it with the hydrogen acid of the halogen, which works well in the case of the chloride, does not answer well for the iodide.

When silver iodide is boiled with solution of sodium hypophosphite, it gives a brown product, evidently indicating that reduction to some extent has taken place; the hypophosphite solution may, or may not, show traces of iodine. The colour of the silver iodide may show a very marked darkening, and yet the solution may give no trace of iodine by the most delicate reagents.

This was very difficult to explain, until I found that silver iodide has the property of taking up and retaining small portions of iodine, a reaction not very surprising in view of the tendency I have found in silver haloids to take up foreign substances of very various natures, and also of the facility with which iodine is taken up by alkaline iodides. This property in silver iodide was verified by shaking up portions of freshly precipitated and still moist AgI with iodine solutions. Alcoholic solution of iodine diluted until it has a pale sherry wine colour is quickly decolourized by AgI, and the same thing happens with a very dilute solution of iodine in KI, which in a few minutes becomes as colourless as water.

This reaction I found particularly interesting, for it not only explained the action of hypophosphite in the case just mentioned, but also gave a clue to the cause of a phenomenon I observed more than twenty years ago, and which then and long afterwards seemed to me an unanswerable argument in favour of the physical nature of the latent image.

At the time referred to, I formed films of pure silver iodide entirely isolated from foreign matter, by reducing metallic silver on plates of ground glass, iodizing them with alcoholic solution of iodine or with Lugol's solution, then washing most thoroughly under a tap for hours. When these films of silver iodide were exposed to light, they received an invisible image which could be developed. But these invisible images, if the plates were laid aside in the dark, had the property of fading out in a few days or weeks, then could no longer be developed, but the film could receive a fresh image. This seemed an unanswerable proof of the physical nature of the latent image at least on silver iodide. The argument was: If the production of this latent image is the result of chemical action involving the loss of iodine by the silver salt, how then is this iodine recovered when the image fades out? If it is formed of sub-iodide, where does this latter substance get back its iodine to return to the normal form, as it unquestionably does?

No answer could be given then or after, and this experiment, repeated and confirmed by others, has always seemed the strongest support of the physical theory. When, however, it appears that silver iodide can take up iodine and hold it, the course matters follow becomes evident. By the action of light a very small quantity of sub-iodide is formed, and combines with the normal to form photo-iodide. The iodine set free evidently does not pass off, but remains combined with neighbouring molecules of AgI, and in the dark gradually recombines with the photo-iodide, re-converting it to normal AgI. In this retention the lower tension of iodine as compared with bromine and chlorine no doubt plays its part.

In thus explaining away the fading out of the latent image on silver iodide, the last argument in favour of the physical theory is destroyed, while the chain of proof supporting this new explanation, that the latent image consists of normal haloid combined with its own sub-salt, remains unbroken.

Reactions.—When ammonia is poured over purple photo-iodide of silver, the colour quickly passes to a salmon, and then, even after some days, seems to undergo no further change. Of separation of metallic silver, as in the case of the corresponding chloride and bromide, there is no trace.

In sodium hyposulphite it dissolves slowly, leaving a slight, but distinct, residue.

Dilute nitric acid mixed with dilute solution of KI slowly, but completely, converts it to normal silver iodide.

Light acts slowly upon it, changing the colour to greenish-grey.

I have already spoken of the remarkable manner in which light acts reversely by development on photo-bromide. On photo-iodide the effect is usually the same as on photo-chloride, viz., the action is direct; but occasionally it reverses, and the exposed part comes out lighter in development than the part that has not been exposed. In this respect the behaviour of the iodine compound is intermediate between that of the chlorine and the bromine.

Note in Conclusion.

The investigations of which the preceding pages are the result, are still unfinished. I have very lately observed the formation of another group of silver haloids quite different from the photo-salts. The members of this new group are deeply coloured, purple or red, not unlike the photo-salts, but are sharply distinguished from them by very different reactions. The photo-salts are unaffected by cold strong nitric acid; these new salts are by very dilute acid instantly converted into a pale pink substance, which appears to be a photo-salt. But the most striking difference is in the action of ferric chloride. A strong solution of this substance shows no action with the photo-salts unless left in contact for many hours or days. But these new haloids are instantly converted by it into what is apparently light pink photo-salt.

So energetic is this action that a solution of ferric chloride containing one part only to a thousand of water quickly attacks these dark purple salts, and decolourizes them. Such a solution might remain indefinitely in contact with the substances I have called photo-salts without affecting them.

Other differences exist. So far as I have yet been able to observe, these new haloids are formed pure, whereas the photo-salts are almost always contaminated with either free silver, or free subsalt, or both. As yet there has been no time to fix with exactness their mode of formation, or their properties, which I hope to do at a future day.

Philadelphia, April 27th, 1887.

IDENTITY OF THE PHOTO-SALTS OF SILVER WITH THE MATERIAL OF THE LATENT PHOTOGRAPHIC IMAGE.

BY M. CAREY LEA, PHILADELPHIA.

In the first part of this paper (page 337) I described certain strongly-coloured forms of silver chloride, bromide, and iodide obtained independently of any action of light, for which I proposed the name of photo-salts by reason of their identity with the products of the action of light on the normal silver haloids, both with the substance of the latent image itself, and also with the principal results of the continued action of light on these haloids. It remains to prove this identity.

First, as to identity with the product of the continued action of light.

If we expose silver chloride precipitated with excess of HCl to light, we get a deep purple black substance which, boiled with dilute nitric acid, gives up a little silver, at the same time somewhat lightening in colour, and forming a dull purple material which closely resembles some of the forms of photo-chloride described in the first part of this paper; mostly those produced by the action of sodic hypochlorite or of ferric-chloride on metallic silver. It shows the same reactions with ammonia that they do. The brighter coloured photo-chlorides are not formed by the action of light on silver chloride.

But these brighter coloured chlorides can also be shown to be formed through the action of light. Most salts of silver darken by exposure, and when these dark products are treated, first with HCl, and then, after thorough washing, are boiled with dilute nitric acid, we can obtain results perhaps as varied as those which I described in the former part of this paper as arising from purely chemical action.

Silver Oxalate exposed for two days to sunshine, covered with water, and with frequent agitation, changed to a deep brownish black, which, by treatment with HCl, became a little lighter. When this product was washed and boiled with strong nitric acid, it acquired a fine deep copper-red colour, the acid taking up silver. This red substance dissolved in ammonia readily, leaving a small amount of black residue; the same with sodium hyposulphite.

(This examination, made a year ago, has recently been repeated with a view to obtaining a quantitative determination of the proportion of Ag_2Cl contained in the red product. The exposure was for about a day; the oxalate at the end of the exposure seemed absolutely black. After treatment with HCl, it assumed a purple black shade. After thorough washing and boiling with dilute nitric acid, which removed a large quantity of silver, perhaps twelve or fifteen per cent. of the entire quantity, it had a fine lilac purple colour. Analysis showed that it contained about one-half of one per cent. of sub-chloride, or, more exactly, 0·45 per cent Ag_2Cl was found.)

The red chloride thus obtained from silver oxalate not only closely resembles the red chloride obtained by means exclusively chemical, but shows the same behaviour to re-agents.

Treated with ammonia it dissolves, leaving a black residue. The formation of this residue takes place precisely in the same manner with both substances. As fast as the material dissolves the liquid becomes clouded, and an extremely fine black substance seems to form within it, which gradually falls to the bottom.

Treated with solutions of the alkaline haloids, the red chloride derived from exposed silver oxalate remains unchanged, after twenty-four hours' contact with potassic chloride, and becomes paler and more lilac under potassic bromide; under potassic iodide becomes grey. These reactions correspond with those of the photochloride.

Silver Phosphate belongs to the more sensitive silver salts, and easily darkens in sunlight. In a few hours it becomes greenish all through, after which, further exposure produces little visible effect. This product becomes with HCl quickly grey, and by treatment with nitric acid after washing, light pink.

Silver Tartrate, by exposure to sun, became quite black. With HCl this changed to reddish grey or dull pink. This product well washed, and let stand with cold nitric acid 1·36, became first lavender, and then light pink.

Silver Carbonate, by prolonged exposure, became greenish black, and with the above treatment yielded a dull pink photo-chloride.

Silver Pyro-phosphate, even by several days' exposure to winter sun, did not blacken, but assumed an ochreous or buff shade. With HCl this passed to a sort of salmon pink, and by heating a few minutes with dilute nitric acid, to a beautiful copper shade.

Silver Acetate was singularly little affected by sunlight. It looked blackish, but on closer inspection was found to be very little altered. By the same treatment as above it yielded a pale pink photo-chloride.

So far as examined, all silver salts thus treated yielded pink or red photo-chloride.

These facts may serve to show the identity of the photo-chloride with the principal product of the continued action of light on silver chloride, and on other salts of silver subsequently converted into chloride. I should wish, however, to use this word identity in a somewhat limited sense. When the photo-chlorides are formed by different methods without the aid of light, hardly any two forms can be considered absolutely identical. They differ in colour and in proportion of subchloride, as already often mentioned, but they also differ in other respects, especially in resistance to re-agents. Some forms are far more easily destroyed by nitric acid. Those obtained by the action of sodium hypophosphite (as presently to be described) are amongst the most easily destroyed by nitric acid. There is variation, too, in the degree of their resistance to ammonia.

Very similar differences are found in the stability of the photo-chlorides obtained by the action of light. Some are much more readily attacked by nitric acid than others. The product obtained by the action of light on silver chloride resists ammonia more strongly than that obtained by the action of HCl on exposed silver oxalate. This last is quickly attacked. Generally, I think, the dark-coloured forms are the most stable. At a future time it may, perhaps, be possible to distinguish more exactly between these varieties.

I next pass to the consideration of the identity existing between the photo-salts and the material of the latent image. Before entering, however, on that matter, it is necessary to describe a reaction leading to the formation of these photo-salts, somewhat differing from the reactions already mentioned, and which has important bearing on the subject.

The remarkable action which an alkaline hypo-phosphite exerts on salts of copper was described many years ago by M. Wurtz. Its action on silver salts, though there is no parallelism between the two, has enabled me to find a key to some of the great difficulties of the latent image.

A dilute solution of sodium hypophosphite, if poured over a mass of chloride, bromide, or iodide of silver, formed in the absence of light, produces no visible effect, but has the property of bringing these substances into the condition in which they exist in the latent image. Applied in strong solution and with the aid of heat, it produces brown purple photo-chloride, bromide, and iodide of silver. I will here briefly describe the first of these compounds, in order to continue the series of photo-chlorides, and then pass to the consideration of the latent image.

Photo-Chloride of Silver by Sodium Hypophosphite

Silver chloride freshly precipitated with excess of HCl and well washed, placed in a flask with a strong solution of sodium hypophosphite and heat applied, begins to darken before the boiling point is reached. Actual boiling for ten or fifteen minutes gives a deep chocolate colour. This product, well washed and freed from traces of metallic silver by cautious boiling with very dilute nitric acid, has a pink, red, or brown colour, varying in intensity according to the length of the action. Sometimes a lavender shade is produced, and this is more apt to be the case when the silver chloride has been precipitated with excess of silver nitrate instead of excess of HCl.

Silver determinations of two specimens of the purified product were made, indicating the presence in one specimen of 1·77 per cent. of subchloride, in the other of 3·53.

By the continued action of heat for many hours, a complete reduction to metallic silver takes place.

Photo-chloride obtained in this way has generally a brown or dull purple colour. Boiled with nitric acid it is apt to break up in as many minutes as some other forms would require hours for decomposition, yielding white chloride, whilst the nitric acid takes up small quantities of silver.

Identity of Photosalts with the Material of the Latent Image.

It is proposed here to show:

1st. That in the entire absence of light, sodium hypophosphite is able to affect a sensitive film of silver haloid exactly in the same way as does light, *producing a result equivalent to a latent image formed by light*, and capable of development in the same way as an actual impression of light.

2nd. That these two effects, the impression produced by hypophosphite and that by light, comport themselves to reagents exactly the same way, and seem every way identical.

3rd. That the image produced by hypophosphite on silver chloride always gives rise to a positive development, but on silver bromide may give rise either to a direct or reverse image, *both of these effects corresponding exactly with those of light.* More than this, sodium hypophosphite may be made to reverse the image produced by light on silver bromide, and conversely light may be made to reverse the action of hypophosphite. So exact a correspondence in these remarkable properties can scarcely be fortuitous.

I.

A silver haloid formed in the absence of light, and subjected to the action of sodium hypophosphite, gives rise to the gradual formation of subsalt, which combines with the normal salt in the manner described in the previous part of this paper. This action of the hypophosphite closely corresponds with that of light. In its initial stages it is invisible, but can be brought out in both cases by development.

If we form a film of chloride, bromide, or iodide of silver, and with a glass rod dipped in solution of hypophosphite make marks upon it, these marks can, with the utmost ease, be developed in precisely the same way as an image produced by exposure to light.

A very simple mode of operating consists in imbibing photographic paper with a solution of an alkaline haloid, drying, applying a silver solution, and then thoroughly washing, all of course with careful exclusion of active light. If the silver solution is acidulated with nitric acid, a drop to the ounce, the result is brighter, but this is not important. In any case the washing must be thorough.

Marks made on this paper can be developed with the oxalate developer with the utmost facility. If a strong solution of the hypophosphite is applied cold, it may be washed off at the end of a minute; but a stronger impression is obtained by allowing it to wait half an hour before developing; or the action may be accelerated and increased in strength by laying the freshly-marked paper on a hot surface—or, better, by steaming it before applying the developer. A convenient mode of steaming it is to lay two pieces of glass on a small water-bath, kept boiling, with a space between them. Over this space the paper is rested for two or three minutes. Paper prepared with a solution of KCl, KBr, or KI, dried, and floated on acidulated solution of silver nitrate, and well washed, if marked with strong solution of hypophosphite and steamed for two or three minutes, will develop the marks as black as ink on a white ground. The use of heat simply gives a blacker development; but a very vigorous image may be got without.

(A similar result may be obtained by substituting for the hypophosphite a dilute solution of potash and an oxidizable organic substance. With milk-sugar the action is very energetic, and heat is quite superfluous.)

Both these are the initial steps of reactions which, when prolonged, result in the visible formation of the coloured photo-salts. It is a matter of interest that sodium hypophosphite, which produces the above-described effects, has no developing power whatever.

II.

The two impressions, that formed by light and that by hypophosphite, are similarly affected by re-agents.

As an example of this identity of effect produced on the two impressions, I first take the action of nitric acid.

Chloride, bromide, and iodide papers were exposed to moderate diffuse light, under a screen with openings, for a proper time to form a latent image, the chloride and bromide for four or five seconds, the iodide for twenty or twenty-five. They were then cut into halves, and one half of each was soaked in strong nitric acid for five minutes. These halves were then washed for some hours, and were developed along with the halves not so treated. Result was, latent image on silver chloride almost, if not quite, uninjured; on silver bromide, somewhat affected, but still strong; on silver iodide, entirely destroyed.

Similar portions of the same papers were then marked with hypophosphite, and were cut into halves, and one half was subjected to the action of nitric acid in exactly the same way as the previous. The result was exactly as before. The hypophosphite marks on the half of the chloride paper that had been treated with acid came out in development as vigorously as on the half that had not been treated. The bromide paper showed the marks weakened by the acid, but still strong; on the iodide not a trace appeared. In all respects the result was the same: what the one resisted, the other resisted; what destroyed the one, destroyed the other.

Another confirmation is presented by the action of the alkaline haloids upon the latent image.

The latent images produced by light on chloride, bromide, and iodide of silver were all treated with cold and moderately strong solutions of potassic chloride, bromide, and iodide for half-an-hour, and were then subjected to development. It was found that all three silver salts bore the action of potassic chloride and bromide fairly well: the images were somewhat weakened, but strong developments were obtained without difficulty. But when potassic iodide was applied the latent image was totally destroyed.

The visible effect of the alkaline haloids on the photo-salts exactly corresponds with their action on the latent image. Potassic chloride and bromide, applied in moderately strong solution and cold, have little effect, but potassic iodide quickly destroys them.

Therefore the action as well of nitric acid as of KCl, KBr, and KI is exactly the same on the latent image impressed by light on AgCl, AgBr, and AgI, as it is on the corresponding photo-salts.

III.

The impressions produced by alkaline hypophosphite upon silver chloride always give rise to direct images darker than the ground on which they are formed. The same substance produces an impression on silver bromide which may, by development, produce either a direct or reverse image; so that there is a perfect parallelism with the action of light.

The reverse action of light, sometimes called solarization, shows itself as follows:— A film of bromide being exposed to light, part covered by an opaque screen, the exposed portion receives an impression capable of development, and this impression grows in strength to a certain point, then recedes and reaches a condition in which it is less susceptible of development than before exposure. All bromide films, even unexposed to light, will darken in a developing solution in time. The portion that under the action of light has reached the reverse stage resists the reducing action of the developer better than that which was not exposed at all, and consequently appears after development as light on a dark ground, and is, therefore, a reverse image. As to the cause of this action we are as yet wholly in the dark. If the continued effect of light was simply to restore the affected part to its original state, we might attempt an explanation by affirming that the continued action of light undid its own work. But the fact of the resistance to reduction being greater than before exposure shows that some as yet unknown action of light is in play. The reverse action cannot be due to oxidation as has been suggested, because hypophosphite reverses, and certainly cannot oxidise.

The reversing action of light on silver bromide finds its counterpart in the action of sodium hypophosphite.

If we take bromide paper (it is immaterial whether in making it the bromide or the silver solution be applied first, but for these experiments on the reversal of the image it is essential that a pure neutral silver solution be employed, and that after the second solution has been applied the paper should be thoroughly washed, all the operations being, of course, performed by inactive light) if we take such paper and make marks on it with a strong solution of hypophosphite, and then throw the paper into potassio-ferrous oxalate, we shall get a direct development; the marks will be stronger than the ground.

If, now, we continually weaken the hypophosphite solution, we shall presently reach a point at which these marks are, in development, indistinguishable from the ground on which they were made; but, continuing the dilution still further, we presently reach a point at which the marks reappear, but this time reversely, as lighter marks on a darker ground. This result is obtained with about a two per cent. solution; the first-mentioned effect comes with a solution of 25 or 30 per cent., so that, according as we use the hypophosphite solution stronger or weaker, we obtain exactly opposite effects. Here the parallelism is striking, but not perfect; at least, it remains to be explained why the action in the two cases proceeds in a reverse order. All the other reactions show a perfect identity.

Time will also sometimes produce the same effect as dilution. Paper marked and put away for twenty-four or forty-eight hours, giving at first a direct image, may, after that time, give a reverse one. This effect is extremely uncertain, and I think, exceptional. I have kept very many pieces for periods from a few hours to several weeks, which first and last gave direct images only. A few became reversed; but the experiment itself, the opposite effect of strong and weak solutions, is liable to no such uncertainty.

Again, we may make light and hypophosphite interact, and each reverse the other's action. To make hypophosphite reverse the action of light, I take a piece of silver bromide paper, expose it to the action of diffuse daylight for a few seconds, then, taking it to the dark room, make marks upon it with a glass rod dipped in solution of hypophosphite. On developing with potassio-ferrous oxalate the marks appear lighter than the ground. Or, what is perhaps more striking, we take two pieces of such paper, retain one in the dark room, and expose the other from five to twenty seconds to diffuse light, then make marks on both with a glass rod dipped in strong solution of hypophosphite, and then, after allowing a few minutes for the hypophosphite to act, place them both in a solution of potassio-ferrous oxalate. The marks will develop, in the one case, as dark on a light ground, in the other (that exposed to daylight) as light on a dark ground.

We have here made the hypophosphite imitate the action of light; it has reversed the image in the same way as would result from a prolonged exposure to light. It will next be shown that light may be made to imitate the action of hypophosphite, and reverse the effect already produced by that or other reducing agents.

If we take the red or purple silver bromide, preparing it with exclusion of light, and the same precaution as in the case of a dry plate, and extend it over paper (it is best, though not essential, to mix it with a little gelatine to enable it to retain its hold on the paper in the subsequent treatment), dry it, and expose it to light under a screen, such as a piece of opaque stiff pasteboard with openings cut in it; then apply potassio-ferrous oxalate, we shall obtain a very remarkable effect: all the parts exposed to light take a reverse development, and appear as lighter spaces on a dark ground. And this goes so far that we may expose till we get a visible and quite strong image, darker than the ground, and yet in development this darker portion will come out lighter than the ground. Indeed, I have one specimen which shows almost white figures on an intensely black ground. Before development these light figures were brown, by exposure to light, on a rose-purple ground. I have seen few more curious results than this.

From the foregoing it follows that red bromide, notwithstanding its intense colouration, is in the same condition respecting light as normal silver bromide that has received an impression of light so strong that any further influence of light would cause reverse action, only that a vastly larger proportion of its molecules are affected. In the case of the latent image formed by light on normal bromide, it would seem that the particles affected, although numerous enough to serve as a basis of development, are still too few and too scattered to be visible or affect the colour. The photo-bromide, on the contrary, has its mass made up of them. Then, if exposed to light, the light carries them a stage further—brings them to the reverse or "solarized" condition—and the parts affected by light develop less strongly than those not exposed.

So light can act the part of hypophosphite, and hypophosphite that of light, interchangeably; each can produce a direct action, each a reverse, and each can reverse the other.

It then appears that in all the numerous ways in which it is possible to compare the photo-salts with the material of the latent image, they are found to be identical. The proofs based on development generally, and especially on the reversal of the latent image, seem very strong, and these receive additional support from the exact identity of reactions shown by the photo-salts, and by the material of the latent image.

The question of identity of the photo-salts with the products of light on the silver haloids might, perhaps, be left with some confidence to the cumulative proofs here offered. But I hope to be prepared to give, in the next number of this journal, additional evidence from a new direction

Philadelphia, March 21, 1887.

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.

Not many years ago photography was an art that required considerable courage, manipulative skill, and dogged perseverance to practise with success. Now, however, "all is changed"; the comparatively recent introduction of the gelatine process has rendered photography so very attractive a pursuit—we were almost going to say amusement—that each day sees new recruits added to the army of photographers, many of whom soon take rank as efficients on the roll. In the wet plate days, not only the dabbling with collodion and nitrate of silver soon disgusted many a would-be photographer, and got him into serious trouble with the female deities of the house, but the size and cumbrous nature of the apparatus—for to carry even a quarter-plate camera and accessories was no light task—soon completed his discomfiture. Now, happily, cameras of featherweight, folded into the smallest possible compass, are the order of the day; and armed with one of these, and three or four double dark slides carrying six or eight prepared plates, a day's photography becomes a real pleasure, instead of being, as formerly, a serious and laborious undertaking.

Yet let us not be mistaken. Clean as is the gelatine process, and easy as it may be to attain a certain amount of proficiency in modern photography, as far as results go, the wet collodion process has not been surpassed for general work, and to produce pictures of the highest class on gelatine plates calls for as much neatness and skill as the manipulation of wet collodion. This is, perhaps, especially the case in the production of lantern slides on gelatino-bromide or gelatino-chloride plates. To produce good slides on these plates demands far greater cleanliness and neatness of manipulation, although not greater skill, than the production of a gelatine negative. Many an amateur who can make fair negatives which give prints of average excellence, fails utterly to turn out lantern slides of even passable quality, solely through lack of neat and clean manipulation.

The magic-lantern—or "optical lantern," as some prefer to call it—is gradually taking a most important place, not only for the purpose of amusement, but also as a scientific instrument. How unsatisfactory is a lecture illustrated by means of charts and diagrams, which no one can see, except those sitting close to the lecturer! And how many an enthusiast has spent weary hours in preparing such charts and diagrams, or, at a heavy expense, employed a professional draughtsman to produce them, when a few pleasant hours with camera and printing-frames would have made him possessor of a set of valuable slides, true to the originals, whether landscape or copies of book illustrations; and possessing the further advantage, when exhibited in any ordinary oil lantern, of being seen and understood without difficulty by the most distant of his audience. To make slides fit for illustrating a lecture requires neither great photographic skill, nor lengthy experience—although the higher the skill and the longer the experience, doubtless, the more satisfactory the results. Yet, possibly for want of knowing this fact, we still find clever men, year by year, making lantern slides to illustrate their lectures by the slow and laborious "transparent slate" process. Such slides, no matter how carefully and exactly done, can never equal those produced by means of photography.

It is for the benefit of such persons that the present articles are written, in the hope of inducing them to avail themselves of the help of photography in illustrating their lectures, to the greater satisfaction of themselves and their audience.

Excellent as are the commercial lantern slides, and numerous as are the subjects they illustrate, they do not, and cannot, satisfy all requirements. Members of literary and philosophical societies, of young men's Christian associations, &c., to say nothing of the members of our learned societies, often desire to deliver a lecture on some special subject, slides to illustrate which can be found in the lists of none of the manufacturers or dealers. It is here where the ability to produce good gelatine positives becomes of the greatest use, and here the amateur can become lantern slide manufacturer without competing with those professionally engaged in producing them.

Again, the tourist on his holiday trip, if able to take a decent negative, may bring home a store of pictures of the prettiest or most important scenes met with on his travels, and go over his journey again with his friends at home, by means of his lantern and collection of slides made from his negatives. No need to carry a ponderous camera, even though it be of the type formerly called "portable," such as the whole-plate camera in the possession of a photographic renegade of twenty-five years ago—a camera of trunk pattern, two feet long, and of ponderous weight, the only thing about it that entitled it to the name of "portable" being a strong brass handle on its middle; a camera concerning which a wag very properly remarked was the very thing for a tourist, seeing that its cavernous recesses afforded ample space, not only for needful apparatus, but also for clothes and baggage for a six weeks' trip. No, the tourist requires only a fairy-like camera and feather-weight apparatus, to enable him to produce negatives of the highest quality, which will afterwards serve the double purpose of making lantern slides or enlargements on bromide paper.

II.—Apparatus.

For lantern slide work, a special camera is very desirable, although not absolutely indispensable. In all work where exactness and neatness are requisite, tools really adapted to the work not only save much annoyance and unnecessary labour, but are great aids in producing the best results. Although a bad workman proverbially blames his tools, it is nevertheless true that an expert workman is not satisfied with bad ones, but always desires to have the most perfect that can be obtained. Hence, although a camera of almost any size and shape can be pressed into the making of lantern slides, it is far more convenient, to say the least, to possess a camera specially fitted for such work.

If a camera larger than quarter-plate size be employed in taking negatives that are afterwards to be used in the production of lantern positives, it will be necessary either to fit the instrument with carriers for quarter-plates, or to make the lantern positive from large negatives by copying in the camera—a process always more or less laborious, and not always satisfactory, from the difficulty of getting awkward sizes of views—such as 7½ by 5—to fit in the ordinary lantern size plate, 3¼ by 3¼.

Cameras made especially for lantern slide work are supplied by the Sciopticon Company, and by Shew and Co., and possibly by others. These cameras are either constructed to take a plate 3¼ in. by 3¼ in., or the usual quarter plate, and are capable of being worked with lenses of long focus, the cameras of the Sciopticon Company having a range of twelve inches, and that of Messrs. Shew one of eight inches. The 3¼in. square camera is very useful for making slides by copying from large negatives, and, in the case of those generally working with a large camera, is to be preferred; but for those who desire a light and portable apparatus, or who take negatives specially for lantern slides, the quarter-plate camera is to be recommended, as the margin of the plate can receive a description label, without intruding on the part to be printed from, and also provides against accidental defects, such as frilling, which in the smaller negative would spoil the picture. Such a camera will serve as a most pleasant companion on a hot summer day, when a larger one would only tend to spoil the photographer's enjoyment by its bulk and weight; and by reason of its long bellows, will serve for photographing both near and distant objects in a satisfactory manner, if provided with suitable lenses. For lantern work, a long focus quarter-plate camera may be called a "universal camera," as it will be found by far the most convenient instrument for copying book-illustrations, some of which have to be reduced in copying, but also at times *enlarged*—and this the long-bellows provides for.

Three or four double dark-slides should be provided, whether the object be landscape work, or copying book illustrations: for it saves much time and needless labour to be able to copy six or eight engravings, as fast as they can be focussed, without having to journey to the dark-room to change plates.

The whole apparatus—camera, slides, and lenses—ought to be kept, when not in use, either in a dust-tight box, or in one of the neat leather cases made by most manufacturers of photographic apparatus, and not left about, exposed to dirt and dust. No apology is made for this suggestion, because such matters are wrongly deemed "trifles" by many; and the man who is markedly careful of his apparatus is considered "faddy" or eccentric. Yet if dust and dirt be "matter out of place" in an ordinary camera, they are tenfold more so in a camera or slides devoted to lantern work; for blemishes that may pass unnoticed on prints on albumenized paper, or be easily touched out, will simply ruin a lantern negative or positive.

It is hardly necessary to observe that a series of lenses is very desirable, both in landscape work and in copying book illustrations. In landscape work, it is frequently found to be impossible to get the camera in a suitable position, if fitted with only one lens—the camera is either too close to include the view on the focussing screen, or so far off that the image is too diminutive. These difficulties are surmounted at once by the possession of three or four lenses—preferably doublets, the components of which can be used singly, thus giving twice the focal lengths of the combination, and permitting distant objects, such as ships, mountains, &c., to be photographed with distinctness and of sufficient size.

These lenses should either all fit in the same flange—to avoid the nuisance of extra fronts or adapters, like the well-known portable symmetrical lenses of Messrs. Ross—or all fit in the same mount—the very acme of portability—like the excellent series of lenses sold by the Sciopticon Company especially for lantern work. Whichever series be chosen, the worker cannot fail to be satisfied. Indeed, the writer does not know of any other similar series of lenses so suited to the purposes of the lantern slide maker; for the series of single landscape lenses, all fitting the same flange, made by Suter, are designed rather for the convenience of the general landscapist.

Of late years, owing to the revived interest in photography, caused by the introduction of gelatine dry plates, and the consequent large increase in the number of workers, much so-called "cheap" apparatus has been introduced, some of which is of fair quality, and capable of doing good work in careful hands, but most of which had better be avoided by all who intend really to work at photography. In these cheap cameras many essential features of a good instrument are omitted, to enable the apparatus to be sold at a cheap rate. Thus few cheap cameras possess a rising front, and this is absolutely necessary in a camera intended for lantern-work, whether landscape or copying. The swing-back, although important, can be dispensed with; but, if possible, both these additions should form part of every camera intended to be used for the production of lantern-slide negatives.

In addition to having a bellows extending to eight or twelve inches, the camera should be capable of being "racked-up" close enough to work easily with a wide angle lens of as short a "back focus" as 1¾ inches; for such a lens will be found indispensable for photographing buildings in confined situations, or mountain scenery, where the camera has often to stand, perhaps at the bottom of a narrow ravine, close to the object of interest. Such range of adjustment will hardly be found in any cheap camera, although all these features are provided in cameras made purposely for the requirements of the lantern worker.

III.—Taking Landscape Negatives for Making Lantern Slides.

In speaking of apparatus we have mentioned the necessity of having a series of lenses in taking landscape negatives from which lantern slides are to be made; for it is not always—and, indeed, not often—possible to bring the camera nearer, or remove it further away, to secure the exact picture desired. The first thing to be done is to choose what the photographer considers the best point of view. Whether it will be so or not will depend entirely on his amount of artistic taste and judgment. In taking buildings, unless it be the only possible position, do not plant the camera right in front of the building, for you do not want an architect's "elevation" of the building, but a pleasing picture. To obtain this, place the camera in such a position as to command a view of the building at an angle, and, above all things, let there be sufficient, but not too much, foreground. There should be enough foreground to give the appearance of stability to the building, for if its base be close to the bottom of the picture it will look very funny on the screen as a lantern slide; and do not try to get the building as big as possible, but try to include other objects that harmonise with the principal object of interest. Such advice might appear needless, were it not for the fact that the writer has seen certain photographs exhibited with innocent pride by amateurs who were not exactly beginners in the art, in which the sole effort seemed to have been to place the camera right opposite the front of a building, and take a view as large as could be included on the focussing screen.

In photographing buildings, and perhaps churches especially, it will often be found that the height of the object is so great that only part of it appears on the screen. In such a case, do not tilt the camera, or the resulting picture will be so distorted as to appear tumbling over; but raise the lens sufficiently high by means of the rising-front. This proceeding will probably bring all of the object on the ground glass; but if it do not the camera must be tilted back, and the swing-back be brought into requisition, when the object must again be focussed. Use a large stop, or on very dull days the full aperture of the lens, for focussing, and then insert the largest stop that will give a correct focus. When the swing-back has to be used, the smallest stop must be inserted, or parts of the picture will be blurred and indistinct. In photographing buildings, generally speaking, a small stop will give the best result for lantern pictures, as the sharper the picture the better, for in this case a microscopic sharpness will not appear unnatural.

Now as to swing-backs; *if* the picture can be included on the focussing screen by aid of the rising-front, it is better to let the swing-back alone; for its use is attended with difficulty, and requires much judgment. Therefore, if the rising-front of the camera have not sufficient range to place the lens at the very top of the camera, replace it by one that has—a rising-front can easily be manufactured at home from a piece of cigar box, by any one possessing a minimum of mechanical ingenuity; for the most exact and pleasing pictures of architectural subjects, whether interior or exteriors, are those obtained where the camera has been placed perfectly level. In a small silver print slight distortion will often be unnoticed, but in a lantern slide every imperfection, being highly magnified when exhibited on the screen, shows out in a most unpleasant manner.

In photographing landscapes pure and simple, more license is allowable in the position of the camera. In a landscape a slight departure from absolute truth is not noticeable; thus, the camera may be tilted a little backward or forward, in the majority of cases, with impunity. In this work the use of the smallest stop is not advisable, generally speaking. The largest that will give a correct focus will make the most natural picture. The distance should not appear in the picture as if seen through a telescope; but everything should appear as visible to the eye; objects close at hand sharp and distinct, and those further off gradually decreasing in distinctness to the extreme distance. Never use a very short focus lens for photographing pictures which include a distant view. The writer has seen an otherwise excellent view of Dove Dale, which was utterly spoiled by the use of a wide-angle lens, the small hills in the foreground unduly magnified, while the mountains in the distance were dwindled into insignificance. Such a picture, if used for a lantern slide, would have appeared absurd, and unnatural even in a greater degree than as a silver print. Wide-angle lenses are only useful in *confined situations*, and where lenses of longer focus cannot be employed.

Concerning exposures, little more need be said than that a *long* exposure will usually give the best results. The shadows *must* be full of detail, to render the picture fit for a lantern slide, and in developing the negative care must be taken to push the development until all possible detail in the shadows has been obtained.

Development of negatives intended for making lantern slides should be slow. Let the developer be weak at starting, and gradually bring it up to the necessary strength. As a rule, evenly dense negatives make the best lantern slides for printing by contact, but they must be free from all stain.

(*To be continued.*)

Notes.

The important papers of Carey Lea, which take the leading position in the Photographic News this week, deal with the question of the day as far as photographic investigation goes; and, as the outcome of this series of researches, we may hope for some definite knowledge as to the nature of the latent image.

Dr. R. L. Maddox, the father of gelatino-bromide plates, and so well-known in connection with difficult work in photo-micrography, is not the gentleman to whom W. M. Ayres referred at the last meeting of the Photographic Society as the "late Dr. Maddox." Dr. R. L. Maddox, who is alive and well, writes to us, under date June 20th, as follows:—"In case friends may suppose the remarks refer to me, will you kindly allow me a small corner in your valuable paper to say, much as I might have esteemed the assistance of so skilled a worker, I never had the honour of Mr. Ayres' company at any of my work. The reference must therefore apply to some other person than yours most truly, R. L. Maddox, M.D."

A well-known photographer, who for some strange reason does not give his name for publication, writes as follows:—"Can you kindly give me any idea what photographers charge for out-door work? I had an order for a dozen 10 by 8 negatives of a town about eighty miles from here, and was two whole days getting these views, as most had to be taken from housetops, windows, &c. I sent in my bill for £5, out of which I had to pay railway fare, hotel expenses, porterage, cost of plates, &c. The people (a London firm) who ordered the negatives object to this, and say they think £2 enough. Before I insist on having the £5, I should be glad to know if you think it too much, considering that I must have walked many miles those two very hot days, heavily laden with traps, and that I shall have no further interest in the negatives. I don't see how I could charge less."

We are sorry that our correspondent does not give his name for publication, and also the name of the London firm that expects a master craftsman to take material and tools for a distance of eighty miles, and devote two days to difficult and anxious work—to say nothing of preparations and finishings at home—all for £2.

The photographer who writes the above is a man who holds nine medals, each one of which carries with it some real distinction—not medals picked up, as it were, off the floor of some village exhibition or trade-show-room, styled an exhibition; nine medals, which in real value are equal to fifty of the easily gotten sort. Of the firm that expects a photographer whose reputation is such that anything he sends in must be of really high class, to go eighty miles and take a dozen 10 by 8 negatives, we will now say nothing more than to recommend them to try the experiment of employing any petty craftsman—say a jobbing bricklayer, plasterer, or carpenter—to go eighty miles and do a job which really ought to require the same expenditure of time as the making of a dozen whole-plate negatives. Five pounds would, we think, go very little way towards paying the bill.

When a photographer has such a reputation that it is worth while to send him eighty miles to make 10 by 8 negatives, a charge of two guineas for each negative would, we think, be moderate; but on this point we should like the opinion of our readers.

A photographer of the young generation, even though he be Cockney born, does not often make the mistake of classing as "cows" every group of cattle he may photograph; he is more observant, and more travelled than the Londoner who was young fifty years ago; and often he has taken his camera as far afield as Switzerland or Norway; indeed, the present race of Londoners are not such abjects as regards rural matters as comic papers would sometimes make out, and the *Pall Mall Gazette* hardly makes a hit in reviving the ancient story of a London boy who, on his return from an excursion, complained of the milk by saying: "Please, sir, I don't like it at all; instead of giving it me out of a nice clean tin, they squeezes it out of a nasty cow—I seed 'em a-doing it!"

All who are interested in collotype printing—and just now there are many such—will do well to carefully read the article on page 394, by W. K. Burton.

To many at the Photographic Society, Anschutz's instantaneous photographs of animals came as a surprise. Similar studies by this photographer have, however, been on sale for a year or more at some of the London dealers, and notably at one shop much patronised by artists who have found Anchutz photographs of horses especially very useful. The grant of the Prussian Government which Anschutz receives is an encouragement to photography unknown in this country. Perhaps it would not be wise to suggest such a thing. A Government grant, somehow, in this country has a knack of not yielding much result. The enormous expense of the *Challenger* Expedition, and the little there is to show for it, is a case in point.

It is to be hoped, for the sake of the Queen's peace of mind, that no one will follow the example of a certain innkeeper of Dover, who, because he boasts of being the heaviest man in the United Kingdom—weighing over forty stone—has sent her Majesty a photograph of himself. If this is considered a fitting Jubilee gift, why not send also photographs of the biggest baby, the largest family, the man who has been a teetotaller fifty years, the man who has been a moderate drinker for the same time, and so on?

The cyclist who goes in for instantaneous photography should be careful what subject he selects. We heard the other day of a young gentleman who, bowling along a lane with a companion, came across a tramp enjoying a nap in the shade of a high hedge. "It would be a good lark to take that fellow, wouldn't it?" said one. The other thought so too, and they proceeded at once to select the best view of the sleeper, and focus. Just as the exposure was being made the fellow woke up, and, being somewhat the worse for liquor, and ill-tempered into the bargain, resented the attempt to take him unawares. Jumping up, he expressed his intention of "smashing the machine," and, as he looked capable of it, the amateurs judged it prudent to compromise matters by the offer of a shilling. The tramp at first demanded half-a-crown, but finally agreed to accept eighteenpence, and went off without even a thank you. For the future, the amateur has resolved to ask the permission of the person he wishes to photograph.

PORTA: HIS LIFE AND WRITINGS.

BY WILLIAM LANG, JUNR., F.C.S.

Among the many philosophers who flourished during the sixteenth century there is one name which to those interested in photography stands pre-eminently forward. Porta and the camera-obscura have now become indissolubly associated; and what may be considered as something exceptional, no other claimant has ever been put forward to divide with Porta the honour accruing to so great and important a discovery. Notwithstanding the great interval in time between our own age and that of the Italian philosopher, the story of his life is not altogether unknown to us. That he was a most prolific author, writing on almost every conceivable subject, the sequel will abundantly show; and although many of his notions may now seem childish and grotesque, still it must be remembered that among men of his stamp astrology and the old alchemical notions regarding the transmutation of metals were matters of belief.

His name in full was John Baptista Porta, or, in his mother tongue—the Italian—Giambattista della Porta. He came of an old and noble family, and was born at Naples about the year 1543. He was brought up under the care of an uncle, who seems to have been a well-informed man, and who spared no pains to develop his nephew's talents. Porta's chief companion was his brother Vincent, whose ardour for learning equalled that of his more illustrious brother. At ten or eleven years of age he was able to write in Latin, and it is said that his compositions were matter of surprise to those who were his teachers. Porta had great delight in reading the works of the philosophers who had preceded him, and this naturally turned his ideas towards cultivating the sciences. Old manuscripts were eagerly perused by the youthful scholar, and when he had exhausted all that Naples could offer him in this respect, he travelled through Italy, France, and Spain, visiting the libraries of the respective countries. He lost no opportunity of meeting with the foremost men of his time, and he was fond of eliciting information from workmen regarding their particular handicraft. Porta thus became, at the age of fifteen, a prodigy of learning, and it is alleged that at that early period of his life he had already written the first four books of his famous work "Natural Magic." On his return to Naples he became one of the founders of the Academia del Oziosi.

A short time afterwards he established in his own residence another academy bearing the name of De Secreti, into which no one was admitted as a member who had not the necessary qualification, which was the discovery of some secret, useful either in medicine, or affecting natural philosophy. In a short time—due, doubtless, in a great measure, to the mysterious name that had been given to the Academy—rumours affecting its members went abroad. It was supposed that the secret meetings were carried on solely for the purpose of cultivating the magical arts, and accordingly Porta had to betake himself to Rome in order to justify himself at headquarters.

The Pope at that time was Paul III., and it would appear that our philosopher had no difficulty in clearing himself from the unjust suspicious raised against him and the Society, although the supreme head of the Church thought it necessary to suppress the Academy, and extort a promise from Porta that for the future he would abstain from practising anything that would savour of the black arts. While at Rome Porta was eagerly sought after by all the learned men of that city, and during his stay he was admitted a member of the then famous Academia dei Lincei. This was in the year 1610. On his return to Naples, notwithstanding papal threats, he still cultivated the natural sciences. In his house, aided by his brother Vincent, he had established a collection of all sorts of natural curiosities, and, as it was thrown open to the inspection of strangers, we find that it was visited by the Frenchman Peiresc, and from what he relates both regarding what might be termed the museum, and Porta himself, a very good notion can be formed of the Italian philosopher, and his ways. Curiously enough, although his taste for the cultivation of science had weaned him from literature, in his old age we find him returning to it. He composed several pieces for the theatre which were received with favour. We shall refer to these in a subsequent article. Porta never married; it is said that he was afraid that by so doing other affections would usurp those he had for his brother. He died at Naples, on 4th February, 1615, and was buried in a tomb which he had caused to be built in the church of St. Laurent.

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E. EDWARDS' PHOTO-MECHANICAL WORKS, BROOKLYN, NEW YORK.

BY W. K. BURTON.

At the date of writing it is about a week after the time when I had the pleasure of paying a visit to the above-mentioned works, which are, I believe, the largest, the oldest, and the most important of the kind in America. If the interest taken by English readers in the subject of photo-mechanical printing is at all equal to my own, they will not be sorry to read a short description of Edwards' works.

The processes worked are collotype, photo-lithography in line, and photogravure. Edwards does not produce type blocks, as he is determined to keep the printing of whatever he produces in his own hands—a thing, of course, impossible where type blocks are concerned, as the great use of them lies in the fact that they may be put up alongside of type.

I take the collotype process first—or, as Edwards prefers to call it, "the gelatine printing process," certainly as good a name as collotype, unless, perhaps it lead to confusion with other processes, such as the ordinary carbon process and the Woodburytype. By the way, Woodburytype, so far as I could gather, is not worked at all in America, and has never been worked with any great degree of success.

In the works at Brooklyn the old process in which the bichromated gelatine is supported on copper plates is used. The effect of the copper is to cause a close adhesion of the film to the support, an effect brought about when glass is used by giving a certain exposure through the glass. Edwards prefers copper because it is not so breakable as glass, and because he considers the exposure of the film through the latter to be a factor of uncertainty.

The copper plates are coated with a plain solution of gelatine and bichromate by hand, and are rapidly dried in an oven. They are then exposed under the negative, a few minutes to bright sunshine being sufficient, the exposure being regulated by the aid of an actinometer.

The plate is now washed in water till all trace of bichromate has been washed out of it, and is dried, when it is ready for the press. This sounds very simple, and the operations look very simple, but great experience is, in reality, necessary to get results with certainty.

As regards printing there are the usual hand-presses, and, besides these, two power machines, which appear to work admirably. It is possible, by pushing greatly, to get 5,000 impressions a day from each machine, each impression being from four plates, so that actually 20,000 pictures a day can be got from each machine, or 40,000 from the two might be turned out. I understand, however, that the ordinary turn-out is about a quarter of this.

The plates are etched with a simple mixture of glycerine and water, after which a number of prints may be made without re-damping the surface. It is not unusual to pull 5,000 copies from one plate, a number which appears enormous. Edwards, however, explained that plates last much better under the power machine than under the hand press, a thing to hear which certainly astonished me greatly.

The work done is of the most varied nature, everything that can be done by collotype being done there. Enormous quantities of the little photographs of theatrical and other beauties which are given away on packets of cigarettes were notable, as also the larger productions of the same nature used as window advertisements, &c. The orders for the small ones are sometimes for several million at a time. That such miniature pictures can be produced closely resembling silver prints shows how fine a texture of image it is possible to get in collotype. These pictures are printed in a number from one plate. Book illustrations of every kind, too, were being produced, and of large work imitation silver prints for advertising purposes—good as examples of collotype, but not in my opinion admirable from any other point of view. The thing most notable and interesting to me, however, was a series of reproductions of recent photographs by Muybridge. All readers will remember well his photographs of the horse in motion, &c. These, wonderful as they were, were defective, inasmuch as they showed no modelling—were, in fact, mere silhouettes. They were taken on wet plates; although when they were first published, at just about the time when gelatine dry-plates were becoming popular, there was a general misconception that they came as one of the early examples of the wonders that could be wrought by the aid of the new dry plates.

In the new series the modelling is as good as could be desired, and the subjects are particularly interesting. There are animals of various kinds—a series showing most accurately a complete cycle of the flying of a bird, for example—but the majority of the subjects are human. They show almost every kind of motion conceivable: walking, running, jumping, ascending and descending stairs, turning somersaults, bowling, batting, throwing and putting weights, &c. &c. The figures are male and female, nude and clothed. Wherever possible, two series have been taken to show the same cycle of motions, one nude, the other clothed, so that the positions taken by the clothing may be accurately observed. As, however, a number of the photographs represent different phases of dressing and undressing, this cannot be carried out in all cases. Some of the photographs—especially those of children—are, as pictures, quite beautiful. I do not know whether these new efforts of Muybridge's genius have yet reached England, but it is to be hoped they soon will, as I can conceive of few things likely to be more useful to artists and others.

Of the photo-lithographic work I think nothing particular is to be said, as it is, so far as I know, worked as it is all the world over. The negatives are made on wet plates, and seemed to me much thinner than I should have thought necessary. The image is printed on a piece of sensitized transfer paper, which is then inked up all over. The ink is then washed off so far as possible, adhering, of course, only to the lines where the gelatine, &c., has been rendered insoluble by the action of light. The ink is then transferred to the stone, and the various processes of gumming, rolling up, etching, printing, &c., are conducted in the usual manner, power machines being, for the most part, used.

The photogravure plates are produced by the Klic process—that is to say, a plate of copper is covered with bitumen in the form of fine powder, so as to produce a grain. The plate is then coated with a sensitized gelatine film, which is exposed under a transparent positive, and afterwards the plate is etched with any fluid which will attack copper, but not gelatine. The result is that the etching goes on less where the gelatine has been rendered insoluble by light than where it has not, a grained intaglio plate being the final result.

Edwards did not show me the actual powdering and etching of the plate, but he told me that the powdering was performed by throwing up a certain quantity of finely-powdered bitumen, and catching a certain quantity of it on the plate as it fell.

The plates as they came from the etching I saw were bold intaglios requiring scarcely any hand work. The hand work, indeed, was, so far as I could tell, by comparing untouched and touched plates, confined to working a little in the very deepest shadows, and burnishing up small touches of high light so as to give sparkle.

The plates were printed from at a greater rate than I thought possible, probably because of the boldness of the etching.

A plate is inked all over, the greater part of the ink is removed by a cloth, and then the flat of the hand, first covered with a little powered chalk, is quickly passed over the face of the plate, removing the last trace of ink from the highest light, and becoming apparently without what I may call discriminating rubbing, just the desirable quanity of ink on each spot of the plate. I mean that there appeared to be no necessity to pick ink out of special parts of the plates, or to "dodge" in the inking. The plate is then pressed under an ordinary copper plate printing press, and the proof came out finished.

A word as to the results. Edwards does not work the very large sizes that one sees coming from the Continent; but up to a fairly large size produces certainly as fine photogravure work as I have seen anywhere. I have spoken of the etching being bold, but it must not be supposed that the results are other than delicate. They are, indeed, delicate in the extreme. The arrangement of subject, &c., is also generally very artistic.

The Meissenbach method of obtaining a grain is used for the photogravure as well as the Klic, but the results are—in my opinion, at any rate—much inferior.

A very beautiful result is got by printing from the copper plates on Japanese paper. The texture of this is delicate in the extreme, and this paper is particularly well suited to receive the image.

These prints on Japanese paper are mounted with spots of paste at the four corners on a white mount, with a curious and very interesting result. If the mount be held quite flat, so that the Japanese paper is scarcely in contact with it, the image appears very soft and delicate. By bending the mount but a very little backwards the paper is brought into close contact with it, and the image instantly stands out bold and clear.

I must not omit, whilst speaking of Edwards' works, to mention a series of photographs which particularly took my attention. They were a series of theatrical groups done by artificial light on the stage. We have had a good many attempts to produce such pictures in England, and the results have certainly been "interesting;" but when that is said, about all that can be said of them has been said. When I saw the groups I refer to, showing the actual action in Shakespearian plays, I remarked, "Ah! but these are from paintings." It is a sad comment on, at any rate, some branches of photography, that whenever we see a particularly good result we incline to think it is from a painting. But so it is. It was long, in this particular case, before I could persuade myself that the groups in question were not from paintings, so perfect were the posing, the apparent action, the grouping, the lighting, and the general arrangement, the scenic background actually giving the idea of distance. I was told that the exposures were only two to three seconds, the lighting being by, I am afraid to say how many arc electric lights—I think a hundred. E. Edwards expresses his intention of attempting, if he have more work of the kind to do, to get what he wants with drop shutter exposures.

Mr. Edwards gave me the following interesting statistics as to the number of impressions that can be pulled from plates, the rate, &c., &c. :—

"The number of prints that can be taken from one gelatine plate on the hand-press varies widely with the printer, the negative, the subject, the paper, and the weather. With a good printer, a favourable subject, in cool weather, 2,000 and 3,000 copies are not unusual. On the other hand, some plates will only last for 50 copies. The average number does not exceed 250 copies. By machine printing, the same conditions hold, but the number of copies is larger; 10,000 from a plate have been printed, but the average number is from 800 to 1,000. The average number of impressions a hand-press printer will make per day, taken small and large, does not exceed 150. By the machine, does not exceed 1,000. The number of photogravures (here we come into the region of certainties, more nearly) that can be pulled from one plate without re-steeling, is 3,000; with re-steeling from 8,000 to 10,000. The average number of impressions pulled per day, say of a subject about 9 by 7 on paper 11 by 14, is 200 to 300.

PHOTOGRAPHY, PAST AND PRESENT.

BY EDWARD DUNMORE.*

The Society whose name has been revived in this flourishing association of professional and amateur skill, was the first photographic society to which I ever belonged, and as now I have been so courteously elected an honorary member of it, I feel much pleasure in contributing my mite in the form of a paper, in which I shall endeavour to call your special attention to that phase of photography that is perhaps more talked about than practised, although I think it is perhaps the only one in which we may anticipate *continuous* improvement.

An opinion I have held for many years past, and see no reason to change, is that the artistic side of photography will eventually dominate every other. Manipulatory excellence has a limit, but artistic excellence has none. We should, therefore, spare no pains in the improvement of this important quality, and we may rest assured that any care and trouble will amply repay us in much better work. The late South London Photographic Society adopted a plan suggested by myself, with the idea of improving our work in this direction, by instituting a series of artistic competitions, which, somehow or other, did not meet with the energetic support of the members I had hoped to see; may be, the moribund condition of that Society had something to do with it. Perhaps, if a similar plan was revived in this Society, with its redundant energy, the results might be different; anyway, I throw out the hint for what it is worth.

The conditions under which photography now and a quarter of a century age was worked are so changed they seem to be almost different arts. It is no waste of time if we occasionally devote a little to the discussion of old plans and processes that in their day (scarcely yet passed) have done so much for human progress and contributed so greatly to the happiness and welfare of mankind. There is doubtless hidden in past and discarded methods of working, germs that will from time to time blossom forth into useful and valuable ideas, and in some new guise challenge attention, and perhaps bring fame and fortune to those sufficiently far-seeing to appreciate their value. Photography has perhaps afforded more pleasure and effected more good to all classes of society than any other art during the present century, a period abounding in good things, and unprecedented in the development of all arts and sciences. At the present time the simplest operation or the most elaborate and scientific investigation receives help and aid from photography, and its usefulness seems ever on the increase. So much has been said and written about it that to say anything new is well nigh impossible, and, whatever it may be, it is little else than a *réchauffé* of old matter gossiped over times and oft.

Photography to its disciples of the present day is mere child's play in comparison with the old wet collodion process. To go out photographing for pleasure then was a serious undertaking, so serious that few save the more adventurous and enthusiastic ever ventured. This was the programme for a day's pleasure in the old days. In the first place a list of requirements had to be gone carefully through—even now this plan has considerable advantages—and the different articles checked off as they were set aside. Now, what were the articles? Firstly came a tent of some kind, with its fittings, bottles, dishes, measures, cups, buckets, and jugs; a long list of chemicals in bottles and parcels, ready-made developer and fixing solutions, plate boxes, draining boxes, racks, brushes, plates and plate holder, collodion, with a great many other odds-and-ends, and last, but most important, that tantalising, worrying provoker of bad language, the nitrate bath. It was almost as customary for a photographer in the old days to ask his friend how his bath was working, as to enquire after his health. The accidents and complaints to which this single important necessary to work was subject was something alarming; it would, after the most fair promises, become afflicted with pinholes, fog, streaks, or markings of innumerable kinds, all objectionable and damaging to the results. You might begin a day's work with everything favourable, then suddenly the bath might go wrong and unworkable just when there was every necessity for things to be working at their best—some especially favourable conditions of light, or some special group difficult to get together. A reserve bath was usually taken, but this added to the weight of the outfit, and time was lost in getting ready this substitution. Making the silver bath right in the first instance was a matter of chemical legerdemain, and keeping it so afterwards a never-ending source of anxiety till it was finally boiled down or put to the residues. Then, supposing the bath was right, there was the collodion, which might be too thick or too thin, or not clear, or crapy, or something objectionable. Again, supposing this to be as it should be, the plates had to be coated, perhaps on a windy day in a dusty locality, no easy task without matter getting into the wrong place, causing defects; or the surface of the glass might be defective, and show stains and markings on the finished negative. All these difficulties being surmounted, and the plate carefully prepared, exposure right, and developmdnt perfect, the film might take to floating off the glass, and ending its career in the drain. Should it escape all these pitfalls, it had to be stored in the draining box, brought home to be dried and finished; these latter stages being rather less troublesome than its modern successor, the gelatine dry plate, save that it was infinitely more tender and liable to injury. When, however, it was successfully finished, the result was simply perfection, and up to date, remains a standard for all other negative processes.

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* A Communication to the North London Photographic Society.

It will be readily understood from this slight sketch that outdoor photography was really a serious undertaking, and that much deliberation and thought were required before adopting it as a hobby and recreation. With all its faults, one has a lingering respect for a servant that has done such good duty, and prepared the way by sound and solid instruction for the process which has almost, if not entirely, superseded it. The advantages of a thorough knowledge of wet plate work reduces the manipulations connected with dry plates to a mere bagatelle. The mechanical difficulties—and they were not a few—are almost wholly done away with, unless the photographer makes his own emulsion and coats his own plates, and one inestimable advantage is gained, he is independent of time. With wet collodion it was absolutely necessary to use the plates within a short time of their preparation, for after a few minutes they began to lose sensitiveness. About half to three-quarters of an hour was the time allowed for the longest exposure. Not much was gained by increasing it. The more rapidly they could be used after exciting, the better was the result. Many plans were used to preserve their sensitiveness and prevent irregular drying. Wet blotting-paper at the back of the plate, a sheet of glass placed over in front of the film, strips of blotting-paper for the plate to rest on, sponging out the interior of the camera or keeping a piece of damp cloth inside it, the use of deliquescent salts in collodion, glycerine in the silver bath, or a short washing of the sensitized plate in distilled water after exciting with a re-dip in the bath before development; these and numerous other plans more or less useful were resorted to to beat time. If we add to this the mess, slop, and stains usually accompanying the preparation of a few negatives, the shyness with which photography was looked upon is easily accounted for and not difficult to understand, and the horror with which the housekeeping authorities viewed amateur photographic experiments is far from obscure. An objectionable process, not always carried on by unobjectionable people, was not altogether the sort of thing to recommend itself as a hobby. Its professors, many of them very estimable men, were looked on with slight favour, photography as a business not being the best recommendation to society. There were some few devotees of the art who courageously strove to raise its social status, but it was uphill work, and it was not until gelatine dry plates became established in public favour that the turning-point was reached, and the hitherto patrons of the photographer became photographers themselves, extending the right hand of good fellowship to those previously looked upon with shyness and misgiving. Since then photography has rapidly advanced in favour, and from being looked upon as a refuge for the destitute and a resort for the needy and disreputable, has become the sport of kings. This, the handmaid of science, is now recognised, appreciated, and beloved by all classes of society, and at the present time no accomplishment is in greater favour than photography. From my experience (and I have no doubt I echo the feelings of many) its pursuit only gives one a greater liking for it, and has a growing and increasing hold on one's affections if fairly successful results are achieved; and after more than a quarter of a century's practice there is as much pleasure felt in seeing the beautiful, delicate image grow under the developer as ever there was.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

8594. William Cunliffe, 33, Harcourt Road, Brockley, Kent, for "Improvements in lithographic, printed, photographic, hand-painted, and other pictures, cards, and similar articles."—15th June, 1887.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

1229 of 1883. A. H. Dawes. "Photographic card pictures."

Official Abstract of Accepted Complete Specifications.

Hosch, 10,483, 1886. "Photo-mechanical printing." In several colours and intensifying tint, by gelatine surfaces prepared in special manner.

Hosch, 10,483, 1886. "Printing surfaces" (*or* in preparation of which photographic means are used). For printing in colours: number of gelatine plates produced in special manner.

Specifications Published.

5966. Henriette Auguste Marie Dittmar, of the firm of A. Dittmar, of Berlin, in the empire of Germany, Album Manufacturer, for "Improvements in albums for photographs."—Dated April 23rd, 1887.

The patentee says:—In photograph albums as heretofore manufactured the photographs are generally fixed by inserting them through slits in the cardboard leaves below the spaces designed for the photographs.

In some photograph albums, especially those in which each side of the leaf is designed for only one photograph, the photographs are inserted through a slit made in the edge of the leaf, which slit communicates with the free space left for the photographs when the several thicknesses of cardboard of which the leaf is composed are pasted together.

In the construction first referred to the ornamental cover paper of the leaf is frequently torn and injured; this construction is moreover inconvenient, and necessitates some skill to insert, displace, or remove the photographs.

According to the present invention each leaf is made in two parts, so that to insert a photograph it is only necessary to separate the two halves or parts from each other, to lay the photograph in the place designed for it, and to again close the two parts of the leaf against each other.

6076. Walter Clark, of the City, County, and State of New York, United States of America, Artist, for "Improvements in photographic cameras."—Dated April 26th, 1887.

The claims are:

1st. A photographic camera provided with an inner lid, to which is pivoted a revolving drum containing the focussing mirror, said inner lid being retained in place by a projection on the plate holder, substantially as described and for the purposes specified.

2nd. A photographic camera provided with a revolving drum mounted on a vertical axis and placed immediately behind the lens, said drum carrying the focussing mirror and provided with a window to admit the passage of light at the proper time through the lens to the sensitive plate, as herein described and shown.

3rd. In a photographic camera, the hinged lid, and ground glass plate pivoted thereto, and raised and supported by links, the parts being so arranged and adjusted that when raised the plate is always the same distance from the focussing mirror, as herein described and shown.

9622. William James Lancaster, of Colmore Row, Birmingham, in the County of Warwick, Manufacturing Optician, for "Improvements in instantaneous photographic camera shutters."—Dated July 23rd, 1886.

A fantail shaped shutter, pivoted above the exposure aperture, and before which aperture the said shutter is flirted or rotated from right to left by means of a spring.

14,410. John Thomas Mayfield, and Joseph Torr Todman, both of 41, Queen Victoria Street, in the city of London, Electricians, for "An improved photographic shutter and method of actuating the same."—Dated November 8th, 1886.

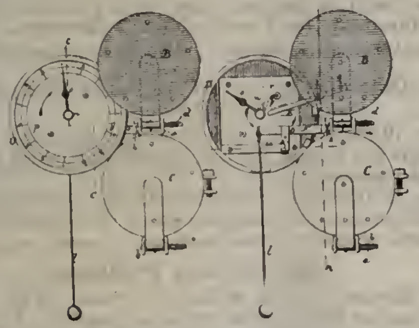
A strip shutter in position of diaphragm, lifted by pneumatic arrangement.

9645. Thomas Samuels, of Monken Hadley, in the County of Middlesex, Gentleman, for "Improvements in or connected with photographic cameras."—Dated July 26th, 1886.

This relates first to modifications of a reservoir back for plates referred to in specfication No. 843, of 1883.

Patents Granted in America.

362,518. Edmond Kuhn, Brooklyn, N.Y. "Photographic time-shutter."—Filed June 29, 1886. Serial No. 206,601. (No model.)



Claim.—1. The combination of the tube A on the camera with the shutter B, and the lever E for holding said shutter open, and a rotating spindle having a lug or cam thereon engaging the lever E, and mechanism, substantially as described, for automatically moving said lever E and unlocking the shutter B, as and for the purpose specified.

2. The tube A of a photographic camera, combined with two shutters, B and C, the shutter-closing spring *d*, the shutter-opening spring *e*, and with the levers E and F and mechanism, substantially as described, for moving them, all as set forth.

3. The combination of the spindle *n* with a spring for turning it, pointer *o*, escapement-wheel *s*, lug *r*, escapement *t*, movable blade *u*, levers E F, and shutters B C, substantially as and for purpose herein shown and described.

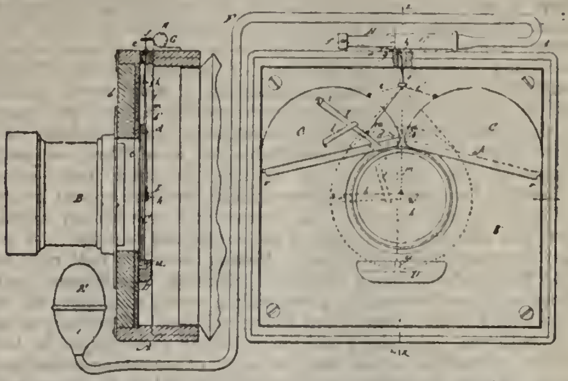
4. In a photographic camera, the combination thereof with one shutter C, and mechanism for holding it closed, with another shutter B, and mechanism for holding it open, and with a timepiece for regulating the period of time which elapses between the opening of the shutter C, and the closing of the shutter B, as specified.

362,663. Wesley E. Roberts, Hartford, Ky., "Shutter for photographic cameras."—Filed December 15, 1886. Serial No. 221,595. (No model.)

Claim.—1. The combination, with a camera-shutter composed of two independent pivoted rising-and-falling sections C C, and with the flexible air bulb and tube F, of the cylinder G, plunger H, and the cords or cord-sections *e e'*, substantially as specified.

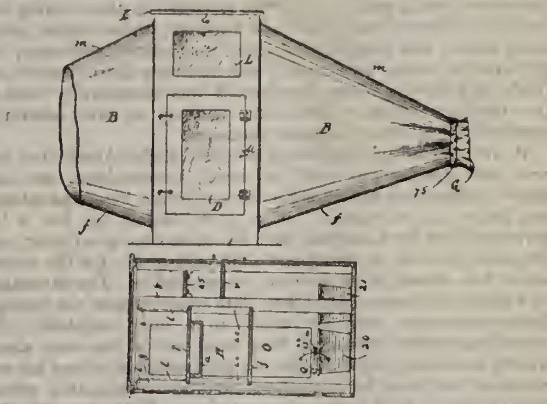
2. The combination, with the camera-box having an exposing-aperture in its forward end, of the pendent shutter-sections C C, the keeper D, the cords or cord-sections *e e'*, the hook *g*, the plunger H, cylinder G, and the air-tube F and flexible bulb E, essentially as shown and described.

3. The combination, with the pendent shutter-sections and means, substantially as described, for opening the same, of an automatically-closing latch carried by the one shutter-section and adapted to engage with a catch upon the other shutter-section, and a cord or connection between said latch and said shutter-opening means, essentially as specified, whereby the shutter-sections are kept from rebounding when closing, and the latch is released and adjusted out of the way simultaneously with the opening of the divided drop-shutter, as set forth.



4. The combination, with the pendent shutter-sections C C, and the cords and cord-sections *e e'*, adapted to open the divided drop-shutter, of the cord *m*, the latch I, and the catch *k*, substantially as shown and described.

362,782. Charles R. Quigley, Boston, Mass., for "Photographic developing-cabinet."—Filed Jan. 26, 1887. Serial No. 225,530. (No model.)



Claim.—1. The improved cabinet herein described, the same consisting of a body having openings in its sides for the hands of the operator, a cover, and a door in its front side, coloured glass being set in said cover and door, and also in the rear and front of said body, funnel-shaped flexible guards secured to the body around said openings, a carriage or elevator provided with shelves, and adapted to move vertically between runs or ways in the interior of said body, counterbalancing-weights suspended from cords attached to said carriage and working on pulleys in the tops of said runs, hinged and stationary shelves in the rear portion of said cabinet, a crank-shaft journalled in the lower portion of the body, a plate-rack secured to said shaft, and tanks disposed in said body, substantially as described.

2. In a cabinet of the character described, the body A, provided interiorly with a counterbalanced carriage adapted to move vertically therein, openings glazed with coloured glass to regulate or colour the light, and guards to prevent the light from entering the openings in said body through which the hands of the operator are inserted, substantially as described.

3. In a cabinet of the character described, the body A, provided with the counterbalanced elevator or carriage H, guards B B, tanks 20 and 21, openings glazed with coloured glass, a door and a cover, substantially as set forth.

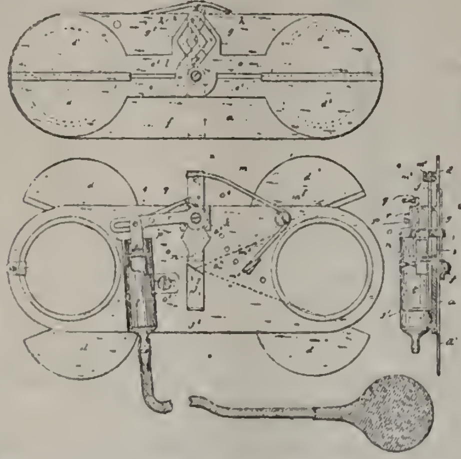
4. In a photographic cabinet of the character described, the plate-holder E, in combination with the screw 47, crank-shaft 14, and body A, substantially as set forth.

5. In a photographic cabinet of the character described, the counterbalanced carriage H, having the shelves *b p*, provided with the vertical openings 15, substantially as and for the purpose set forth.

6. In a cabinet of the character described, the body A, pro-

vided with the ways *g* and guards B, in combination with the carriage H, provided with the shelves *b p a*, cords *l*, and pulleys *i*, substantially as described.

363,547. William E. Schneider, Washington, D. C., "Shutter for photographic cameras."—Filed Feb. 10, 1887. Serial No. 227,173. (No model.)



Claim.—1. A face-plate for photographic cameras, combined with a two-leaf shutter having slotted crossed arms, an operating slide connected with said slotted arms, a detent for holding said slide, and means, substantially as described, for operating the detent, and through it the slide to shut the shutters or to open and shut the shutters, substantially as set forth.

2. Shutters for a stereoscopic camera, consisting of leaves provided with crossed arms having substantially obtuse-angle slots crossing each other, combined with a slide having a pin engaging such slots, a detent for retaining said pin in any given position, and a tripping device for said detent, substantially as set forth.

3. Shutters *d* and *d'*, movable toward and from each other to close and open the lens-tube of a camera, and arms *e e'*, provided with cross-slotted portions, combined with a face-plate having a vertical slot in alignment with the intersecting portions of said first-named slots, a slide having a pin passing into all of said slots, and also provided with a pin on its opposite face, a pivoted detent having shoulders to engage said last-named pin, a dog engaging said detent, a lever carrying said dog, and a lever operating device—such as a pneumatic engine—for actuating the dog to disconnect the detent from the slide, substantially as described.

4. A two-leaf shutter in which the leaves are movable toward and from each other to shut and open the lens-tube, provided with a slide and crossed arms pivotally actuated, a supporting-plate provided with a slot, a slide provided with a pin engaging all of said slots, and a spring co-operating with said slide, a detent for said slide, and means, substantially as described, for operating said detent, substantially as set forth.

5. A face-plate for a stereoscopic camera, shutters *d d'*, connected to said face-plate by crossed arms, slotted projections on said crossed arms, a slide connected with said slotted arms and spring-pressed, and a detent and means for operating it, substantially as described.

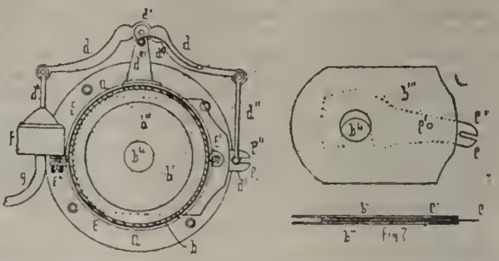
6. The swinging detent provided with a bevelled end, combined with the shutters, crossed arms, and slide, substantially as described.

7. A detent provided with shoulders o^2 and o^3, combined with a slide having a pin to co-operate with said shoulders, a spring bearing down upon said slide, means, substantially as described, for disengaging the detent from the slide, and shutters connected with said slide, substantially as described.

8. A two-leaf shutter and guides in which the leaves have a vertical movement across the lens-tube to open and close the same, combined with pivoted crossed arms having slotted projections *g g'*, and a spring-pressed slide, combined and arranged to operate substantially as described.

9. Plates *d* and *d'*, having overlapping edges to cover and uncover the lens, centrally crossed arms *e e'* therefor, provided with slotted projections *g g'*, and an operating slide, substantially as described.

363,429. George C. Stanley, Ithaca, N. Y., "Stop-shutter or diaphragm light-controller for photographic cameras."—Filed March 29th, 1886. Serial No. 196,882. (No model.)



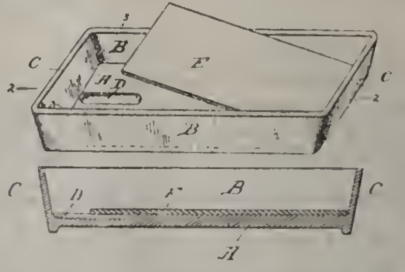
Claim.—1. The combination of the diaphragm-plates *b'' b'''*, placed between the lenses of a camera with the slotted shutter *c*, pivoted between said plates, substantially as described.

2. The clasping-ring *e*, adapted to and supporting a pivoted lever by clasping a lens-tube, in combination with a lever and a shutter, which shutter operates in connection with the aperture of a diaphragm of a lens-tube, as set forth.

3. The shutter *c*, pivoted to the central diaphragm of a lens-tube, and inserted between the lenses of a camera on the inside of the lens-tube, and there operated to open and shut the aperture of the diaphragm, as set forth.

4. The ring about the lens-tube, provided with a rubber air-valve attached to one side of the ring, and a connecting-lever *d*, attached to the top of the ring, and a shutter *c*, whose outer end projects out of the lens-tube on the other side and connects with the lever, as shown and described.

363,505. Sherburne W. Burnham, Chicago, Ill., assignor to Gayton A. Douglass, same place. "Photographic developing-tray."—Filed March 15th, 1887. Serial No. 230,939. (No model.)



Claim.—The developing-tray having a horizontal flat bottom, said bottom being provided with a narrow shallow finger-groove, substantially as specified.

Correspondence.

THE PHOTOGRAPHIC CONVENTION OF THE UNITED KINGDOM.

Sir,—Allow me, through your columns, to announce that detailed programmes of excursons and local arrangements of the proceedings at Glasgow for the week commencing July 4 are now ready, and will be forwarded on application.

The excursions will include visits to the Falls of Clyde, the Trosachs, Loch Lomond, Loch Long, Yacht Regatta at Largs, Loch Fyne, and Edinburgh. I have pleasure also in announcing that the Hon. the Lord Provost of Glasgow has kindly consented to open the proceedings on the evening of the 4th prox.—Yours, &c.,

128, *Southwark Street, S.E.* J. J. Briginshaw.

The following synopsis of the week's proceedings has been issued:—

Monday, 4th July.—Conversazione at 7.30 o'clock at the Glasgow Institute of Fine Arts, 175, Sauchiehall Street.

Tuesday, 5th July.—Excursion to the Falls of Clyde, in charge of Geo. Bell. Excursion to the Trosachs, in charge of T. N. Armstrong. Evening meeting at 7.30 o'clock.

Wednesday, 6th July.—Excursion to Loch Lomond and Loch Long, in charge of John Stuart. Excursion to the Yacht Regatta at Largs (by special steamer), in charge of George Mason. Evening meeting at 7.30 o'clock.

Thursday, 7th July.—Excursion to Tarbert, Loch Fyne, by steamer *Columba*, in charge of Wm. Lang, Junr. A group of the members will be photographed at Tarbert by John Stuart.

Friday, 8th July.—Excursion to Edinburgh. On arrival at Edinburgh the party will be taken in charge by the following Edinburgh friends:—James Crighton, William Crooke, J. M. Turnbull. Evening meeting at 7.30 o'clock.

Saturday, 9th July.—A photograph will be taken of a group of the members at 10 o'clock in Kelvingrove Park, West End. Meeting of the Committee at 11.30 in the Convention Rooms.

THE BIBLIOGRAPHY OF PHOTOGRAPHY.

Sir,—Will Mr. G. W. Valentine, who sends, in your number for June 10, some additions to the "Bibliography of Photography," explain why he accuses me of having "omitted" the said articles from my list? Is it necessary *again* to repeat that my lists have so far only related to my "Class I., Printed Books," and that magazine articles belong to my Class III., for which I doubt if you will ever be able to find room in your columns, as it includes some thousands of titles? I hope, however, soon to commence "Class II., Photographic Periodicals." Mr. Valentine has evidently never read the introductory chapter (see Photographic News, Jan. 1, 1886), or my replies to Messrs. Lang, Werge, &c., which have appeared during the last month; but I should have thought that the study of any one of my lists would have shown him that the titles I have hitherto published are those of *books*, and not of isolated articles extracted from magazines. The immense collection of the latter which I have formed will be given, if possible, in their proper turn.

W. Jerome Harrison.

PHOTOGRAPHIC EXHIBITION IN DUBLIN.

Sir,—Please permit to correct a slip in your editorial note this week. All communications concerning the Exhibition are to be sent to *Monkstown, Co. Dublin*, not *Royal Hibernian Academy*. If sent to latter, they may lie for weeks unopened.

With regard to applications already received for entry form, &c., this will be sent in due course about 1st September.—Yours truly, Greenwood Pim, Hon. Sec.

Exhibition Committee, Monkstown Co., Dublin, 20th June.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on the 16th inst., W. H. Prestwich presiding.

A. L. Henderson handed round a few lantern transparencies of racing scenes in America. These were the work of a Philadelphia firm. He also showed a collection of negatives of the Jubilee yachts taken at anchor off Southend and along the route to Harwich. A series of prints of Ascot on the Cup day, including the race, were, moreover, exhibited.

J. E. Brown (Melbourne) said:- The first formula I wish to bring before your notice is perhaps the most simple and, to my mind, the most effective one I have used for retouching on dry plate films. I could never see the necessity of using ten or a dozen chemicals if two would do and give results as good. Formula:—Take powdered gum dammar, one ounce; best white turpentine, sufficient to dissolve it; this is applied with a piece of rag or sponge. When the film appears very horny or bright I rub it with a little dry cuttlefish just before applying the medium. For a long time I advocated and used the following medium for retouching:—Take Venetian turpentine, six drachms; common resin, four drachms; mastic varnish, two drachms; spirits of turps (rectified), two ounces; benzine, about half a drachm; camphor, fifteen grains; make up to the consistency of negative varnish by an addition of white turpentine. Now I have given up this formula in favour of the first one, which is more simple to work, and does not interfere with the progress of the pencil by tackiness. The next recipe I wish to bring before your notice is one for making hard negative varnish:—Dissolve half an ounce of orange shellac and half a drachm of camphor in about a pint of methylated spirit; when dissolved, add about a tablespoonful of pumice-stone (powdered)—some people recommend ashes; shake well, and let settle over night. In the morning it will filter beautifully clear; if too thick, add spirits of wine. For intensifying I have always found the following safe and practical:—A. Bichloride of mercury, one ounce; chloride of ammonia, one ounce; potassic iodide, one ounce; dissolve the mercury and ammonia salts in ten ounces of water, putting them both in together, and add sufficient of the strong iodide of potash solution, shake well, and make up to twenty ounces with water. B. Silver nitrate, half an ounce; potassium cyanide, sufficient to dissolve out the first precipitate; now make up this bulk to twenty ounces with water. This solution should not be used at full strength when little density is required, but diluted to half. The fixed and well-washed negatives should be placed in a dish containing the A solution, and gently kept in motion for a few seconds; examine from time to time until it appears quite dense, take out and well wash again until the film is an even yellow all over, then place in a dish containing the B solution, and let remain until the film becomes a beautiful olive brown, then lift out and set aside to dry. Another formula very much used in Melbourne is a saturated solution of bichloride of mercury and iodide of potash; the negative is whitened in this, washed, placed in a saturated solution of sulphite of soda, but do not allow the negative to remain sufficiently long to reduce.

A discussion upon retouching mediums and forms of mercurial intensification followed, but no new facts were elicited.

The remarkably adhesive qualities of fish glue was a subject of conversation, and its use in emulsion work was suggested.

Some effective prints were shown by J. B. B. Wellington, in which the composition of cloud and landscape were much admired.

Manchester Amateur Photographic Society.

The monthly meeting was held on Tuesday at the Masonic Hall, Cooper Street, the President, the Rev. H. J. Palmer, in the chair. The following lady and gentlemen were elected members:—Miss E. J. Stanley, Messrs. Thos. Hall, John Say, and T. W. Markham.

The Council presented a report with regard to the desirability of starting a quarterly magazine or record of the proceedings of the Society, to act as the official organ of the Society, and recommend the formation of a guarantee fund for the purpose, and requested members willing to subscribe to such a magazine to give in their names to the hon. secretary.

The several leaders of the outdoor meetings or rambles gave a report of the success of the rambles that have taken place, and particulars of the ones arranged for during this month, viz., to York, Chester, and Alderley.

G. H. B. Wheeler read a paper on "The Improvement and Retouching of Landscape Negatives." He began by speaking of the great number of negatives that from divers causes, preventible and otherwise, do not print as wished, and are therefore cast on one side, and form a skeleton in the cupboard to which we often turn with vexation of spirit; these he advised the members to bring out and either end or mend them. Passing briefly the commoner faults of thinness of the image and over-density, with their causes and remedies, Mr. Wheeler proceeded to describe the methods employed to improve negatives untouched, and improved prints from which, pasted to one mount, were handed round for the inspection of the members. The prints showed how over-dense portions had by local reduction with chloride of lime been made to print, how by retouching and strengthening the foreground the picture was artistically improved, and how by marking at the back with vegetable parchment (sold for jam-pot covers) worked upon with pencil and stump, a negative having extreme light and shade can be improved. Mr. Wheeler exhibited a home-made retouching desk of very simple construction, and in his remarks on retouching said that a desk was essential to comfort and good work, that the paragon retouching medium was the best he had tried, and that H B and B pencils are the best to use for landscape negatives.

S. D. McKellan exhibited and described his patent camera with its newest improvements, including his new focussing screen protector, which does away with the use of a focussing cloth. This protector can be fitted to any camera, and was much admired. Mr. McKellan also exhibited his patent mechanical rocker, and McKellan and Muth's auxiliary view meter and focusser.

At the conversazione held after the meeting, the tables were literally covered with photographs, the result of the Easter and Whitsuntide holidays and the Society's rambles. Prints were exhibited by Messrs. Fildes, J. G. Jones, G. Wheeler, J. Davenport, C. Dawson, W. Berry, J. A. Furnival, Guilford, Smith, Hutchinson, and Witham.

CAMERA CLUB.

ON June 16th, a short paper, entitled "Film Staining and Halation," was read by LYONEL CLARK. The chair was occupied by F. MACHELL SMITH.

Previous to the address J. F. ROBERTS exhibited a compact detective camera introduced by Messrs. Watson and Sons, in which the plates were dropped into their place from the double holders in which they were stored. The focus could be adjusted by means of a movement of the handle by which the apparatus was conveniently carried. A rapid rotary moving shutter was fitted to give the exposure.

W. A. GREENE showed some experiments in printing-out positive images by long exposure on Eastman negative paper, and

D. P. RODGERS drew attention to some strong paper envelopes just introduced, which were made to sizes for storing negatives in, and were prepared outside for the entry of particulars.

L. CLARK then gave his lecture, and in discussion,

D. P. RODGERS said the slowing effect of litmus in staining might not be of great importance, seeing the rapidity of plates as now made ; but

L. CLARK stated that it would appear to have the effect of reducing them all to a standard rapidity not many times faster than wet plates.

J. TRAILL TAYLOR explained a method (by piston and cylinder) by which he had obtained a clear turmeric solution. He had observed that in looking out into the light from Fingal's Cave the phenomenon of the interference of light or halation appeared at some of the openings and not at others, where, presumably, the atmosphere was clear of dust or vapour. In referring to the backing of plates, he described a simple but pretty experiment, showing halation to be obviated by a substance being brought into optical contact with the glass.

H. H. O'FARRELL asked why tinctures were not used in isochromatising plates.

H. W. HYSLOP stated that the colour did not seem to enter the film so well or homogeneously ; some of the dyes would not dissolve in alcohol and some in water, but required half-and-half. He had found some difficulty with cyanine, as with alcohol it gave a small deposit. He found the fuchsine he had used slowed the plates, and it was a substance it was extremely difficult to get rid of from the films it was used in.

A. PRINGLE said in the early days of gelatino-bromide plates the use of a backing was nearly always adopted, but when iodide was introduced there was less necessity for such treatment. His experience was in agreement with Mr. Hyslop's, that iodide plates treated with isochromatising solutions were as good as bromide plates treated similarly. He had not, however, found his samples of fuchsine have any slowing effect upon the plates treated with it, though there was some difficulty in dissolving it.

L. CLARK had developed some isochromatic plates with oxalate, and they retained their red non-actinic colour throughout. He thought that the most important point was the use of tinctures in these processes, so as to secure rapid drying. Possibly the difficulties met with in regard to making alcohol take up the colour were to be overcome. It took up the colour more slowly, and he thought that by a very long digestion in a warm room the object would be obtained.

Club excursion for members and friends to Marlow on Saturday, June 25.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting was held on Tuesday last, when the President, T. S. YEOMANS, occupied the chair.

Dr. T. H. MORTON read a paper on the subject of the best lens for an amateur to possess.

In the discussion which ensued, the rectilinear was upheld as being the most desirable for general purposes.

The first excursion of the season took place on the following Thursday, Haddon Hall being the place visited. Though the light was good, a high wind prevailed, and most of the work was done on the "interiors" of the old hall. Altogether twelve cameras were used, and one hundred and thirty plates and films exposed.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting will take place on Tuesday next, June 28th, at 8 p.m., at the Gallery, 5A, Pall Mall East, when the subject will be "Camera Stands and Outfits ;" also a negative on Balagny's flexible film will be developed.

PHOTOGRAPHIC CLUB.—The subject for discussion on June 29 will be "Aids to Exposure." Saturday outing at Lea Bridge ; train nearest two o'clock from Liverpool Street.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C. ;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

C. W. A. F.—Your letter has been delayed, and we will write to you privately.

J. C.—It is a matter which would have to be determined by experiment; but, in the ordinary course of things, many of the rays you refer to are cut off by the lens.

PRESERVER.—1. See pages 200 and 201 of the current YEAR-BOOK. 2. An article on the latest and best details of this method will appear in the NEWS next week or the week after.

L. L.—As the details of the mischief which has happened to you may call forth information from some readers who have had useful experience, we reproduce the substance of your letter: "I am a photographer, and have been in the business about ten years; off and on have toned and fixed prints during that time. About four years since, my hands became affected by doing so in a manner that suggested to me blood poisoning. Each of my fingers—the right hand principally, that being the most in the bath—began to "itch" in a very irritating manner from the nail down to the second joint of each finger, and soon after break out into, or rather come up in, small red pimples, and then break out into small sores; but if I left off toning or fixing for a day or two, my fingers recovered their usual appearance. Now, having recently taken up the toning of prints again, I find the same thing occurring that I have just described."

M. E. D.—See the notes on page 392, and please let us have further particulars for publication.

G. W. B.—The portrait of Fox-Talbot (photo-gravure) was issued with the PHOTOGRAPHIC NEWS, March 11th, 1881; that of Mungo Ponton with the YEAR-BOOK for 1882; that of Daguerre with the YEAR-BOOK for 1881. Woodbury's portrait appeared in the NEWS of August 11th, 1882, and Doctor Diamond's portrait in the number issued on July 9th, 1886. As regards a portrait of Robert Hunt, the simplest way will be to write and ask him where it can be obtained.

CHARLES MARSTEAD.—A weak alkaline solution will soften it. Try soaking in a mixture of liquid ammonia one part, and water 20 parts.

The Photographic News.

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For Advertisement Scale see page v.

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PATENT OFFICE LIBRARY

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1504.—*July* 1, 1887.

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THE RECENT RESEARCHES ON THE NATURE OF THE LATENT IMAGE.

The series of papers from the pen of the distinguished American photo-chemist, Carey Lea, together with the note from Dr. Hodgkinson which we published last month, give us a clearer insight than we have ever previously possessed into the nature of the "latent" or (better) photographic image.

It is remarkable that the two chemists whose work we have recorded should have been pursuing this, their latest research into the subject, for exactly the same period of time—about three years. But Dr. Hodgkinson has been rather handicapped by the usually gloomy weather of our country, to which the present summer forms so welcome an exception, his method consisting chiefly in a minute chemical examination of the substances produced by the continued action of sunlight upon the haloid salts of silver.

Carey Lea, on the other hand, has been able, as he believes, to render himself independent of the action of light in this respect, having discovered numerous methods of producing these "photo-salts" by the action of chemical re-agents.

Of these reagents the most remarkable appears to be sodium hypophosphite; which might apparently be considered as equivalent, photographically, to *liquid light*, since it "is able to affect a sensitive film of silver haloid exactly in the same way as does light, *producing a result equivalent to a latent image formed by light*, and capable of development in the same way as an actual impression of light." It will be strange if some industrial application is not made of this fact.

So far as published, it would appear that the work of Carey Lea and of Hodgkinson has been complementary the one to the other. While Lea has discovered numerous ways in which the material forming the latent image can be prepared without the aid of light, Hodgkinson has taken the same substance as formed by light, and endeavoured to determine its chemical composition. On this latter point Carey Lea says little or nothing that is definite; he alludes to it as "haloid salt" occasionally, but prefers to call it a "photo salt," which—chemically speaking—may mean anything. On the other hand, Dr. Hodgkinson's quantitative analyses of the material composing the latent image—though as yet unfinished—show pretty decisively the presence of oxygen in addition to a halogen and the metal.

Perhaps the most important point of all is that the "physical theory" of the latent image has now received its death-blow. Of this theory Carey Lea was the originator, and perhaps the chief supporter. It might also be called the "vibration theory," since, according to it, the only effect of light upon a sensitive film is to throw the molecules of the silver salt into a state of more rapid vibration; in which state they are more easily acted upon by the developer. But Carey Lea has recently found, and with all the frankness of science is the first to state, that the principal experiment upon which he relied to uphold the physical theory is to be explained in quite another way.* We are now compelled to believe that light exercises a dissociating influence upon the silver salt, driving off part of its chlorine or bromine as the case may be. According to Lea, the resulting subsalt unites with unaltered haloid to form a "photo-salt." Hodgkinson, however, believes that oxygen (from water which is always present in and on an ordinary "dry" film) takes part in the reaction, and that an oxychloride is formed. On behalf of the photographic world we earnestly ask these two distinguished workers to continue their researches, and not to rest until they have completely laid bare a subject which has been more or less a mystery from the earliest days of photography down to the present time.

◆

MAYALL'S PATENT FOR "IMPROVEMENTS IN THE PRODUCTION OF PHOTOGRAPHIC IMPRESSIONS."

It is not very often that we comment upon photographic patents, it being our usual course to allow them to tell their own tale; and had no unusual circumstances been connected with Mayall's Patent, No. 5080, of 1887, published on p 379 of the present volume, we should have followed our usual course.

The unusual circumstance is the publication of a report on the patent, in which the significance of the report appears to be largely based upon the reporter being a Fellow of the Institute of Chemistry, and "Abridger of Photographic" and other Specifications of Patents to the Honourable the Board of Trade.

As the report alluded to may be calculated to lead an inexpert person to regard Mayall's patent as representing a definite advance in the direction of photography in colours, or as embodying a method of permanent photography, we may say that Mayall's patent appears to us to describe a means of making a coloured or uncoloured albumen silver print, the permanency of which will be presumably no greater than any ordinary silver print, the print, if coloured, being coloured entirely by hand-work, and no approximation towards photography in colours being described. The description of the method of working is cumbered with details and additions of no import whatever; and in those places where, from the wording, a non-technical reader might think he had hit upon novel features in the "method," the specification becomes about as meaningless as one of Toole's amusing burlesques of a "Scientific Lecture." Indeed, we may assume that no reader of the Photographic News who has read the specification as it appears on page 379 requires to be told this; hence we should not have considered it necessary to criticise the specification had not the report appeared.

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* See Photographic News, June 24, page 386.

The report first reached us in the form of a printed slip, and was not accompanied with any sufficient indication of its authenticity to justify us in publishing it, consequently we wrote to the author, and received an authentic copy, which we now publish; but in publishing it we must express intense surprise that one who is allowed to add emphasis to his words by announcing himself as a Fellow of the Institute of Chemistry, and an "Abridger of 'Photographic' and other Specifications of Patents to the Hon. the Board of Trade," should thus write regarding Mayall's specification (p. 379).

Report.

According to request I have examined Mr. John Jabez Edwin Mayall's patent specification, dated April 5th last. I have also had from Mr. Mayall himself certain illustrations and explanations of the process set forth in the specification above mentioned, and have arrived at the following conclusions.

The process is a continuous one for the production of permanent photographs—it is also a process of colouring the photograph by the use of chemical affinities having intimate relation to the action of the colours of the object photographed upon the photographic film.

In giving the theory or method of action of the process, in the clearest terms, it is necessary to commence with the image first formed. This image is the one on the negative plate formed by actinic rays that emanate directly from the sitter. But the rays from the sitter convey more to the photographic film than the simple actinic or chemical rays, namely, the rays of white or combined light and the rays of coloured or analysed light. The immediate suggestion is:—Do the colour rays really affect the negative plate in a latent manner, so that they may be made manifest afterwards when a proper medium for their appearance, either selective or otherwise, is provided? To test this view, it is necessary to compare it with the effects of each part of the process and with the result obtained.

The negative acts as its name implies in not doing what the positive does, or in doing it in the reverse way. The chemicals used are concerned simply in forming the image by the action upon them of combined light to produce form and gradations of the same neutral tint, according to the amount of photochemical action that takes place in the same duration of time on the various parts of the plate.

The coloured rays that fall upon the negative have, nevertheless, left an impression there, for they have different rates and qualities of vibration which the particles on the negative plate have felt the influence of; moreover, it is now known that they retain these rates of vibration and such other peculiarities of those vibrations as the chemicals used permit. Therefore, it remains to ascertain by a thorough analysis of the processes used in preparing the positive plate whether those vibrations of colour, stopped off and stored up in the negative film, are allowed to become active on the positive film when the exposure again to light (under the negative) takes place. The principle here brought to bear upon the question is, that the negative and positive plates are registers of the vibrations which they respectively receive. If the above suggestion be the true one, this process is the nearest approach that has yet been made in photography to the practical realization and application of the relative colour vibrations of light as determined by Dr. Young.

Prior to answering the question as to whether the process is such that the colour rays from the sitter exercise a selective influence upon the ultimate colour of the photograph in its various parts, colour for colour, it is well to remark that the inventor has put into practice certain broad principles, not rigidly observed before, but absolutely necessary to be adhered to, if any approach to perfection be aimed at.

The manipulation commences quite anterior to that of other processes. Instead of accepting the paper, as furnished by the paper makers, the inventor devotes his attention, at the various stages of the process, to perfecting the correctness of its surface, so that it may be perfectly plane. The value of this part of the general idea running through the whole process like a beautiful thread of exactitude is, that a truly flat surface is obtained to receive the image, by printing, from the negative. In fact, the quality of the surface, as built up by the various processes, may be compared with that used in optics for reflecting or other purposes. This optical surface has another function, inasmuch as being mathematically correct, it limits the actions, catalytic in their character, which are in force to build up the coloured image, and causes them to be uniform in all parts of the photographic surface.

Another point that is steadily kept in view by this process is that the quality of the paper, or its initial covering of gelatine and albumen, is borne in mind, so that it may not be composed of a collection of fibres merely, but that, photographically speaking, it may be seen to be structureless, that is without granulation or fibre, even when submitted to the higher powers of the microscope.

The paper being thus built up with a view to its perfection of shape and quality, the requirements of after processes are kept in mind by the inventor from the beginning. In each process a basis is laid for some subsequent operation. Not, only are the developing and fixing stages suitably provided for but the balancing the chemical affinities from time to time, and the operations necessary for the production of an ultimately unchangeable and permanent image, are essentially attended to.

These points can be easily traced because of this continuity of design and purpose in the process as a whole, and because the inventor has had the courage, determination, and ingenuity to begin at the very beginning, building up his excellent process step by step, and proceeding with magnificent march, gradually but perfectly to the end of his manipulations, till the final and truly artistic and scientific result is attained.

In sequence, the processes may be called—1, gelatinising; 2, albumenising; 3, sensitizing; 4, fixing; 5, colouring; 6, waxing; 7, setting the colour; 8, glazing; 9, finishing.

In the first or gelatinising process, a basis is laid for subsequent development of the picture by the presence of lactate of iron; the film produced is oxidable, the iron waits for something to unite with it.

The second or albumenising solution is still more complex, and contains principles which aid the action of light upon the sensitising salt afterwards to be applied. The interaction of the well-known substances, the glacial acetic acid (used to clear the albumen), chloride of sodium, and potassium bromide, is still kept in abeyance by the salicylic acid; the compound of silex lays the basis of the vitreous coating afterwards to be given. The meconine (a derivative of opium which has special red colouration relations with iron) gives fair play to the formation of colour and image, a peculiar bloom being thereby produced on the image. Owing to the organic radicles present, the condition of the chemicals already used is unstable; therefore the accomplishment of the following three things is rendered possible:—1. A selective action by the vibrations or undulations of the light to which the plate is subsequently subjected; 2. The ultimate attainment of permanency; 3. The action, subsequently exercised, to fix the colour when it is established and developed.

The third or sensitising process provides for the diffusion of an exactly similar condition over the whole surface of the plate. The ammonia acts to equalise and absorb any of the unprecipitated parts induced by the action of the salicylic acid.

The use of weak sulphuric acid, after the fourth or fixing operation, is a truly chemical improvement, as it provides more completely than has hitherto been done for the expulsion of the last traces of sodic hyposulphite. This part of the process also contracts the albumen and converts the argentic chloride into an oxide, which expands as the albumen contracts.

The fifth or colouring operation is peculiar to this photographic process, and provides a colour basis from which the selection is made by the stored-up vibrations of light which the image has utilized, according to the colour of the dress or appearance of the sitter. The colours dabbed on are reproduced in the photograph in the intensities and quantities of light and shade given by the negative plate.

The sixth or waxing operation stops the colour from passing through to the back of the picture; it also renders the paper impervious to moisture of any kind.

The setting of the colour in the seventh operation by means of salicylic acid solution brings into use its antiseptic qualities, and the other adjuncts assist in fixing the colour and preventing its alteration by time.

The eighth or soluble glass process is a fine and original method of effectually sealing the results of the previous work in a casing transparent and resistent to all atmospheric influences. The underneath silicic surface may be said to be the plane of the picture, or the real pictorial surface.

The ninth or finishing process gives the plate a true, plane surface, and provides for the permanence, protection, and unchangeability of the colour, form, and depth of tint of the final picture.

The colours employed are so attenuated and rendered so mobile during their application (as well as unchangeable in tint) that the greatest opportunity is given for the various interactions, actinic, photo-chromatic and selective, to assert themselves according to the original vibrations (colour and otherwise) to which the sitter was subjected during the sitting.

The remarks to each process will enable the reader to observe that if the colour influences, and other photographic influences, are capable of being selected, finited, and fixed, they have all the necessary opportunities for accomplishing these important and novel results in the most perfect manner.

In the "Text Book upon Photography" published in 1878 by Longman and Co., and written by Captn. W. de Wiveleslie Abney, R.E., F.R.S., pp. 9 and 10, is an admirable exposition of the molecular action of the rays of light in travelling through the photographic film, in which he establishes the transference of energy throughout. In regard to the storing up of the energy, which is ordinarily called "absorption of light," he says:—"Now, according to all ideas of conservation of energy, this absorption must indicate the performance of some kind of work. It may be that it causes the already vibrating molecules to take up and swing in some complicated manner with those rays particularly absorbed, and thus to cause a rise in temperature in the body, so small indeed, perhaps, as to be undistinguishable, owing to the rapid cooling due to radiation; or it may be that work is performed in effecting chemical decomposition." It should also be noted that "where light is not entirely absorbed, but is only reduced in intensity, even then also work must be performed by it; for the intensity of any coloured or white light is dependent on the extent or amplitude, as it is termed, of the wave or waves; and any diminution of the amplitude indicates that a portion of its available energy has been exhausted, and that, therefore, a transference of the portion so expended must have been made to the body through which it passed."

The subject matter of this quotation immediately replies, in the strongest affirmative terms, to the question originally propounded, namely:—"Do the colour rays really affect the negative plate in a latent manner, so that they may be made manifest afterwards when a proper medium for their appearance, either selective or otherwise, is provided?" Moreover, from the processes above analysed, it also appears that the colour rays from the sitter exercise a selective influence upon the ultimate colour of the photograph in its various parts. When light is made use of a second time in producing the picture, namely, in photo-printing the positive from the negative plate, it takes up the rates of vibration and the qualities of the vibrations of the negative in a complementary manner, and gives to the positive plate all the characteristics of molecular condition (including latent colour vibrations) that it would have had if the positive had been taken at once, without the intervention of a negative, suitable chemicals being used.

The film of form, depth of tint, and colour exists between two perfect films of glass, produced by the processes above detailed and annotated upon. This important part of the very fine and perfect results obtained, has reference to the attainment of absolute permanency and comparative indestructibility in the finished picture.

The conclusion, therefore, at which I gladly arrive, is that Mr. Mayall's process is the most perfect of its kind, both in regard to its perfection of optical form, its selection of the precise colour of the sitter, and its permanency.

W. H. WALENN, F.I.C., F.C.S.,
Mem. Phys. Soc. Lon.; Abridger of "Photographic" and other Specifications of Patents to the Hon. the Board of Trade.
9, Carleton Road, Tufnell Park, N.,
May 13th, 1887.

Considering that the above report was issued by a member of the Institute of Chemistry, and partly under cover of the name of the Institute, it becomes the duty of the Institute of Chemistry to inquire into all the circumstances in which the report was issued, and whether any effort has been made to use the report as a means of inducing capitalists to invest money. It is, moreover, to be hoped that the Patent Department of the Board of Trade will give some attention to the matter.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTE.

BY CHAPMAN JONES.

Chapter VIII.—Light Intensity—Photometers—Actinometers—Sensitometers—Reflection—Plane Mirrors—Reversed Negatives, etc.—Concave Mirrors—Production of Real Images—Spherical Aberration.

It is not possible to estimate the intensity of light, because there is no practical zero or unit; but there are many methods that serve to compare light intensities together. Photometry, however, is not of primary importance to the photographer, because he has not so much to do with the visibility as with the chemical influence of light.

Many actinometers have been devised to measure the chemical power of light, and though each is, perhaps, useful, no one is of universal applicability, for obviously each measures only those kinds of light that affect it. The staining power of light upon chloride of silver is not equivalent to its decomposing action upon a mixture of dichromate of potassium and gelatine, and though the first is successfully used every day as a measure of the second in carbon printing, it is not an accurate indicator. A piece of ordinary silver paper may require twice as long exposure on one day as another before a standard tint is brought out, but it does not therefore follow that a gelatino-bromide plate must have twice the exposure to give an equally developable image. But such an indicator, although it is not exact, is a very much better guide than the unaided eye, and the convenient forms of actinometers now to be obtained deserve a far more extended use than they enjoy. The chemical effects of different sorts of light, and the effects of various aerial and other absorbents, will subsequently be referred to in more detail.

Actinometers have been constructed in which the chemical effect has been allowed to proceed for a unit of time, and the result has been measured, or the change has been allowed to reach a uniform result, and the time has been observed. Bunsen and Roscoe used a mixture of hydrogen and chlorine, and estimated the amount of hydrochloric acid formed. H. Draper used ferric oxalate, and noted the amount of carbonic anhydride given off by its decomposition; but paper prepared with a silver salt is generally the most convenient for practical purposes.

Sensitometers are instruments for comparing the sensitiveness of sensitive surfaces, and require a light that shall be uniform from time to time, and reproducible at any place as may be desired. Such a standard light has not yet been shown to be possible, nor is there any known means of discovering the difference between what might be an accepted standard, and an actual light made to be as near to it as circumstances allow. There are so many matters that influence luminosity that it is highly probable that uniformity will never be attained. Warnerke's sensitometer is the instrument invariably used in practice in testing developable sensitive surfaces, and the light used is a screen coated with luminous paint, and excited just before the test is made by burning a piece of magnesium ribbon in front of it. A screen with a series of tints of graduated depths is placed over the plate to be tested, and produces from the uniform light a graduated series of luminosities. A far more perfect method of graduating the light that reaches different parts of the plate from a uniform source, is to employ a series of diaphragms, as in the sensitometer designed by Mucklow and Spurge. It is obvious that when a developable film is being tested, the light must be graduated, because a uniform effect cannot be secured (the time then being in inverse ratio to the sensitiveness), as the result is not apparent until development.

When light impinges upon a surface of any sort, a part of it is invariably reflected. Most ordinary objects scatter the light in all directions, but polished surfaces reflect regularly, that is, they simply change the direction of the pencils of light that impinge upon them.

Any surface that is used to get regular reflection is technically called a "mirror," and according to the shape of the mirror, whether flat or curved, so it is termed plane, convex, concave, cylindrical, parabolic, &c.

The commonest example of the plane mirror is the ordinary looking-glass. The plane mirror does not produce any true image, but as it bends the pencils of light in almost any direction, it enables one to see round a corner. The effect of a plane mirror is shown in fig. 4. The eye sees the ball and also a reflection of it, because the light that emanates from the ball in the direction of the line towards the mirror has its direction changed, and enters the eye. If light from the same object reaches the eye in two distinct directions, the effect is the same as if there were two objects, for two images are produced upon the retina, and the eye knows nothing whatever of anything outside itself, but only interprets the light that enters into it. A reflection of this sort that appears like an image, though it is not one, is called optically a "virtual" image.

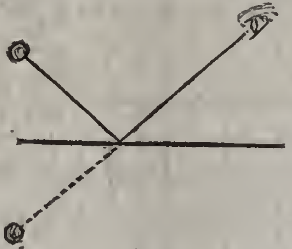


Fig. 4.

The effect of looking at an object by means of a plane mirror, instead of directly, as when we use a looking-glass to view ourselves, is to cause a lateral inversion in the appearance of the object; the right-hand side becomes the left, and the left becomes the right. The same effect is produced by viewing a print or transparency through from its back. All photographs produced direct in the camera (Daguerreotypes, collodion positives, &c.) are laterally inverted, and so also are single transfer carbon prints. Ordinary negatives are inverted laterally, but as a second lateral inversion takes place in printing on surfaces where the print is not removed from its support by transference, the print is not inverted. What is technically called a "reversed negative" is a negative reversed as compared with an ordinary negative, not reversed as compared with the object photographed. In optical language, the image on an ordinary negative is laterally inverted, while that on a "reversed negative" is not inverted.

Where the process to be employed is one that naturally gives an inverted picture, the inversion can be corrected by producing a second inversion, and this is most conveniently done by photographing the reflection of the object in a plane mirror instead of the object itself, and so producing a "reversed negative." The mirror is generally placed close to the lens, as the light is more concentrated there, and a smaller mirror is sufficient. The mirror used for this or any analogous purpose must have only one surface, that its effect may not be complicated by secondary reflections, and the surface used must be truly flat, or it will produce distortion of the image. It is customary to employ specially polished pieces of glass, coated with metallic silver on the front, the metal being polished. The glass is simply a convenient support for the silver, and is not used on account of its transparency. Ordinary looking-glass is quite useless, because its reflecting surface is at the back, and any oblique ray after reflection at the coated surface is partly reflected back again from the front surface of the glass, and so passes to and fro, giving a series of images which get fainter as the amount of light reflected is reduced. (*To be continued.*)

ON THE VARIATION OF PHOTOGRAPHIC EXPOSURES THROUGHOUT THE YEAR.

BY C. WOOD.

In the following paper I purpose to consider photographic exposures principally in connection with outdoor work.

The introduction of the various dry plate processes rendered the consideration of the duration of exposures of much more importance than when wet collodion was used.

In that case, when the photographer arrived at the scene of his labours, although burdened with all the essentials required for developing the plate on the spot, yet this very development made him master of the situation, and enabled him to use plate after plate, each exposure giving him an idea of that which would succeed it; and if an error was made, the subject might usually be tried again. It was also possible to prolong the work, or pleasure, as it may have been, well on into the earlier part of twilight. Not so, however, with dry plates, and especially with those of the great rapidity furnished by plate makers of the present day. Of course, it would be possible to develop on the spot, but a very great part of the advantage gained by saving of time and reduction of weight of apparatus would be given up.

This, then, being out of the question, a means of accurately estimating the exposure is a necessity. It often happens that the place cannot again be conveniently visited, or the particular effect desired does not again present itself; and although in cases of importance a duplicate exposure of different duration may be made, one would naturally hesitate to give up the chance of a later exposure on a desirable scene with the certainty of having at least one negative for which there is no use.

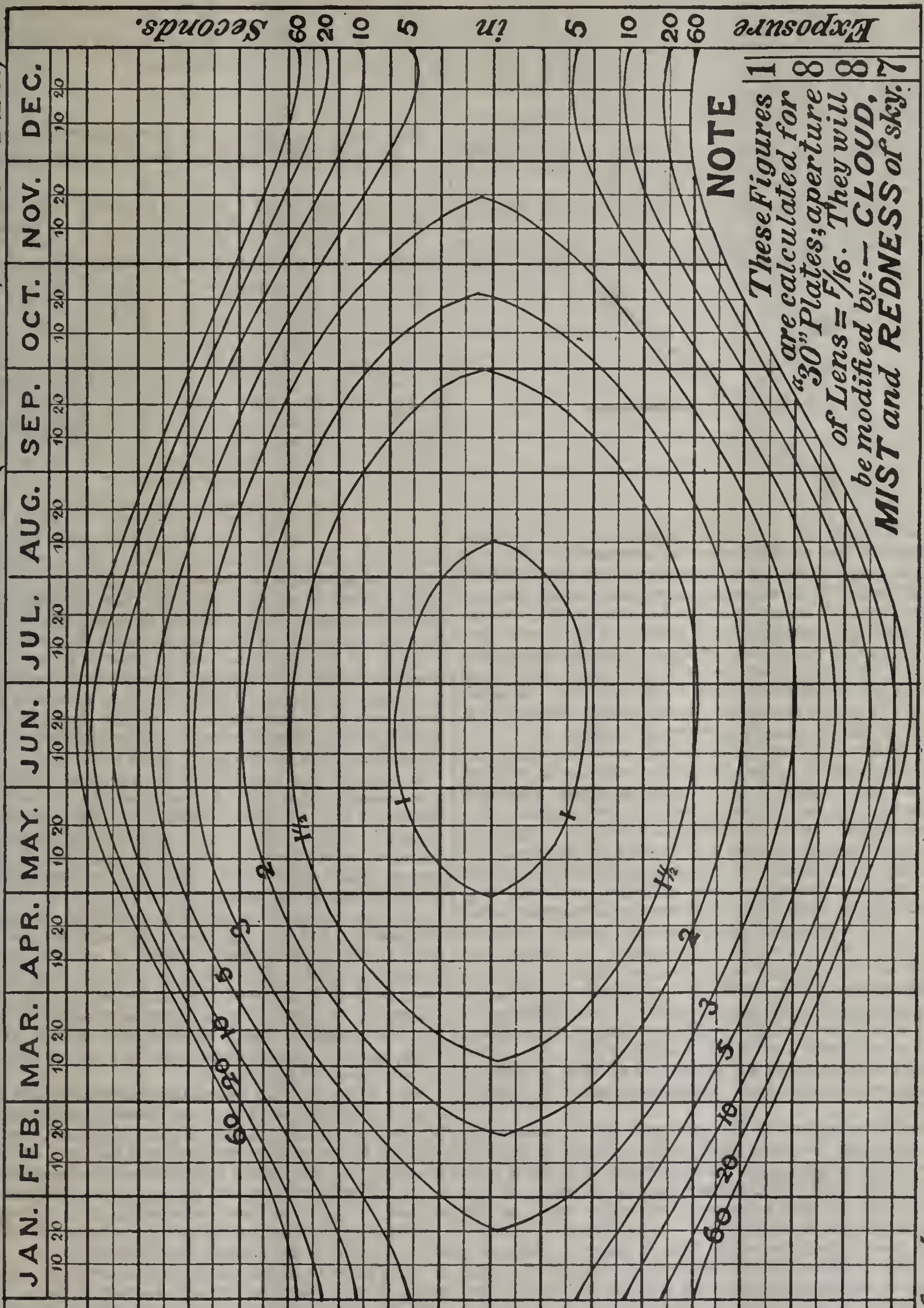
A great deal may be effected by judicious development to counteract the results of error, especially in cases of over-exposure; but at the same time it is clear that with the majority of those who practise photography, either for business or pleasure, there is but one correct interval during which the sensitive plate may be exposed to the action of light in the camera.

An examination of records and results of exposures at different times of the day, and at different seasons of the year, and extending over a period of several years, has shown that, with a few exceptions, which may be considered separately, all seemed to be, as far as duration was concerned, in proportion as they approached or receded from the periods at which the best light may be expected. These periods are the month of June for the year, and the solar noon for the day.

Now what can have caused the existence of this appearance of proportion or due ratio between such exposures? We get our supply of actinic light (omitting all notice of artificial means of illumination) from the sun, and as the amount of light obtained from that source varies according to the obliquity with which its rays strike that part of the surface of the earth under consideration, it follows that, the state of the atmosphere being the same, the altitude of the sun above the horizon must determine the amount of light present at any time. The answer to the above question will then be found. Exposures made during sunlight, other circumstances being the same, will vary according to the elevation of the sun above the horizon.

On comparison of records of such exposures it was found that those made at periods when the sun was fifty-four or more degrees above the horizon were very nearly equal in value, and may be said, with a certain make of plates and a stop corresponding to U.S. No. 16, to have required an exposure of one second. Again, it was found

A TABLE OF PHOTOGRAPHIC EXPOSURES. (SUNLIGHT; JAN – DEC.)



C. Wood.

Stanford.

that at times, when the exposure was doubled with satisfactory results, in the same recorded good light, the altitude of the sun must have been just 27°, or the half of 54°, while an altitude of 18° required three times the exposure. As a result of pursuing the research still further, and experimenting meanwhile under similar conditions, the rule may be laid down that the exposure may be determined by dividing 54 by the altitude of the sun in degrees.

The exceptions referred to were all exposures when the sun was very near the horizon, and when the inverse ratio between altitude and exposure would be at its greatest, and consequently most liable to error, which, again, would itself be excessive.

The accompanying diagram embodies the tabulated results of this enquiry, and the plan of exhibiting the duration of exposures by means of curves is a novel method of placing before the photographer, at one view, the whole of that part of the year during which in England the sun is above the horizon. In addition, the continuity of the curves is a further advantage, which would have been lost if any other form of table had been adopted.

The exposures shown are for a given plate, a given aperture of lens, and a given state of the atmosphere; and where these are not present, allowances must be made. If the plates are faster than so-called "30" times or "ordinary rapid," decrease the time. If the lens be used with a smaller or a larger diaphragm, increase or decrease the time in proportion. If the atmosphere contains masses of opaque cloud, or be filled with transparent mist, or, in the morning or towards sunset, should the sky glow with red or yellow light, increase the exposure. Further, the exposures shown are of average duration for outdoor work with the above-stated conditions of plate, lens, and atmosphere, and, except in cases of trees in the immediate foreground, will seldom require to be exceeded. In this case, from the non-actinic colour of trunks and foliage, a longer exposure should be given. Trees also prolong the exposure in another way, by acting as a shade and keeping out the light from objects under them. For open landscapes the exposures may well be halved, and for coast scenery still further shortened, since views made up largely of sea and sky require the shortest of all exposures, the water reflecting the sky in proportion to its smoothness of surface. Whatever stops or plates the diagram be used with, it will give a correct idea of the comparative value of sunlight in England throughout the year, from the best light of a June mid-day, or the weaker light of a December noon, to the greatly diminished light when the sun is near the horizon.

To use the diagram:—Look *down* the column corresponding with the period of the year, and *across* the line corresponding to the time of the day. The intersection of these, either *on* one, or *between* two, of the numbered curves will indicate the exposure; for example, the exposure on 20th of April, at four in the afternoon, is ascertained to be (for a given plate, lens, and state of sky) two seconds, or twice as much as would have been required on the same day at noon, and just one-fifth of that required on the same day at 6.20 p.m. For the sake of clearness, the upright lines are ruled for the first, tenth, and twentieth days of the month, and the horizontal lines for hours and half hours only. For the same reason the curves are few in number.

It remains still to explain the means by which the curves have been determined. This can scarcely be done satisfactorily without the aid of additional diagrams. Let it be sufficient to say, that on a plane, the hour lines of a horizontal sun-dial suitable for the latitude of London were set out, and that by means of a table of the sun's declination the meridian altitude of the sun at twelve (solar noon) was found for certain days at intervals of a week apart. Next the hyperbola traced by the shadow of the highest point of the "style" of this dial was set out for certain days, together with a series of circles drawn from the point where the perpendicular let fall from the highest point of the style on to the plane of the dial touched the same, and having diameters corresponding to the natural cosines of the angles 54°, 27°, &c., referred to above. Now, there were three sets of lines upon the paper: the hour lines, the curves of the hyperbola (with their neutral line), and the circles. The intersections of the two latter gave the times of the solar day at which the sun had the required altitude on the given date. This time was read off by means of the hour lines, and, making allowance for the equation of time, was converted into Greenwich time, and marked off on the vertical lines of the table. Curves drawn through the sets of points so found completed the diagram. The traces of the shadow of the top of the style on the horizontal plane would be represented, approximately, by a straight line at the vernal and autumnal equinoxes, and as the summer solstice is approached, by much flatter curves than at corresponding periods approaching the winter solstice.

As described, this may seem a roundabout way of determining a geometrical problem, but in practice it is really very simple, and a considerable portion of the matter being available from previous calculations further facilitated the operation.

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BUSINESS MANAGEMENT.

BY CRITICUS.

No. VIII.

The elucidation of several of the more important details likely to prove useful to anyone about to commence the business of photography having received due prominence in foregoing articles, the time has arrived when we are at liberty to devote a little consideration to other matters of no less interest. Before doing so, however, we desire to call especial attention of readers who have not followed the series, but are desirous of engaging in photography as a professional pursuit, to the remarks which were made concerning the purchase of a business. And we might further add that the conditions suggested as a guide to the construction of new premises should not be overlooked. It is, of course, next to impossible in a few short articles such as the present represent, to include every detail of practical value which should be generally known; we can but embody the chief points. Thus, since dealing with the requirements of a printing room, it has occurred to us that we should have laid some stress on the manner of finishing walls, ceiling, and metal fittings; we therefore avail ourselves of this opportunity of referring to it. For instance, iron rods, gas barrel, &c., unless carefully protected from damp with paint or varnish, are liable to become rusty, and form a prolific source of metallic spots in silver prints. Limewashed walls and ceilings are also objectionable from their tendency to cause spots. Failures from these causes, we believe, will be admitted by all printers who have experienced the conditions referred to, and we are sure they will agree with our advice, that the internal walls and ceiling of a printing-room can be more advantageously lined with match-boarding, and painted or varnished; and further, that this apartment should not be used as a general workshop for carpentering, metal turning, brazing, and finishing, paint mixing, and sundry other purposes such as we have seen performed by photographers of a mechanical turn of mind.

We now propose to refer to a few of the general tactics resorted to as a means of advancing the interests of businesses, for it must not be supposed that the possession of all that is requisite in the way of plant, together with suitable arrangements for making use of the same, even to the extent of attaining resulting photographs of the highest state of perfection, is all that will be necessary to insure financial success. More remains to be done; and therein lies the problem to solve. Thus, a proficient photographer, comparatively or entirely unknown when starting in a strange neighbourhood, may open premises with a display of work of fairly average quality, though possibly inferior to that supplied by other and long established photographers surrounding him. Nevertheless, he may succeed if he supplements his show of ordinary photographs with some novelty of an attractive character. We remember an instance which happened a few years ago, in the wet collodion days, which it is worth while to recall. It was the circumstance of a London photographer starting a new business into full swing at a busy town on the Yorkshire coast by what might be termed a necessity arising from accident. This is how he did it. All the building arrangements of studio, workrooms, &c., being complete, and a fair display of specimen photographs—made elsewhere—on view, the business was duly opened, and a large number of handbills, announcing the fact, freely distributed. But when the first half-dozen sitters made their appearance, the difficulty of comets with very long tails appeared also, and every negative taken had these drawbacks. He knew full well the cause, and that it would be disastrous to his reputation at starting to request fresh sittings upon another day; he therefore wisely said nothing about it, but in printing took care to vignette off the backgrounds. Three-quarter and full-length vignettes were a novelty in that part of Yorkshire, and by means of a little smartness in making the most of his opportunity a good connection and a profitable business soon sprang up.

Another tactic, which is more familiar now-a-days in large cities, is portraiture by artificial light. This, of course, everyone is well aware can be effected in a satisfactory manner by the aid of an electric current of high intensity connected to one or more arc lamps. An efficient illumination can also be produced by burning the metal magnesium—the powder form, we think, is the best to use—either alone or mixed with a proportion of potassium chlorate. Other compounds may also be used, but in all such cases combustion should take place in a suitable lamp constructed to emit the largest possible amount of light, and carry off by-products. In the same category we also place luxograph and photogenic mixtures of the pyrotechnic order.

All the above have contributed towards increasing the receipts of a new venture, as well as those of matured business in need of improvement. In deciding upon one of the foregoing methods of illuminating by artificial light, it should be remembered that the cost of installing electricity of sufficient quantity and intensity for the purpose of producing high class portraits is likely to prove an expensive experiment, unless the photographer is so situated that he can obtain a reliable supply from large works in his immediate neighbourhood. Even then there is a considerable expense involved in fittings; this, however, would not be a matter of serious import, but rather the contrary, if it could be demonstrated that the end was likely to justify the means. At any rate, photographers who are located in busy centres need not defer a trial of this system of lighting should they feel so disposed, until the cost of dynamos and accumulators have been greatly minimised, or until the municipal institutions of this country have so far progressed as to lay on the current to every household in as convenient a manner as water and gas are customarily found to be. When electricity can be at moderate cost obtained from a system in operation close by, we doubt whether the advantages at present derivable would be found to justify several photographers in a particular locality embarking in the venture. We think it possible, though, that one or two houses in each of our large cities might find it profitable to dispense with daylight, which does not cost anything, in favour of a complete system of electric lighting; it is, moreover, quite certain that good businesses have been for the most part built up by the novelty of the system, rather than from other causes. We therefore do not recommend its adoption except as a distinct speciality. With magnesium, at the present low price of this metal, the case is very different; indeed, we think it by no means improbable that before long more attention will be given to this mode of lighting. The advent of such a state of things may possibly lead to an alteration in what has hitherto been the usually recognized hours of business for photographic establishments. Recent advances in orthochromatic photography tend in a similar direction from the commercialist's point of view; and it would not surprise us if, in the near future, photgraphers' studios were to receive more public patronage of an evening than has at any former period in their history been customary. We are certainly not inclined to advocate longer hours of labour for the staff, who are in many cases inadequately remunerated already for their services, for evening attendance might not in the long run be proportionately paid for; neither do we admit the necessity for a change in the routine of photographic establishments, such as a general introduction of evening business would be certain to bring about; but, as an adjunct likely to be beneficial under some conditions, we give it a place among the tactics available. For a similar purpose ordinary house gas may soon take a very prominent position, and already several fairly successful attempts have been made, but as yet the results are too primitive to be of much commercial value.

It is scarcely necessary to more than allude, in passing, to several other items in the business of photography which have in recent years played a part. One of the chief, so far as direct work is concerned, was the introduction of diamond cameo portraits, which represented four aspects of a sitter's face, and gave rise to modes of lighting since then further developed, Rembrandt effects, so called, being a result. The diamond cameo imparted an impetus of a tolerably wide-spread character. Enamelling the surface of prints, now so common, and the introduction of other shapes, designated cameo and cushion, which followed the more complicated and patented method, have continued to gratify public taste, and add to photographers' profits up to the present time. True the demand for the "carte" size has signally fallen off of late, and we are obliged to confess that many photographers force the sale of cabinet and larger sizes to the disparagement of the "carte;" but is such a policy wise? We think not; and from a long experience, we are able to say unhesitatingly that the demand for duplicates of cabinet photographs and larger sizes does not now, nor do we think it ever has, reached anything like the magnitude of after-copy orders yielded by the "carte" size. As a matter of fact, the two classes of portrait more particularly named "carte" and "cabinet," bear no comparison to each other in this respect. This may in some degree appear to be an unimportant objection; but in reality the popularity of a photograph is to a large extent guaged by orders which follow. It is therefore incumbent upon professional photographers to endeavour, as far as possible, to create a more than passing interest in their everyday work, in order that future orders may be realised, for upon the extent of such most frequently depends the measure of financial success which will, in all probability, follow their efforts in business. When a specific article—photograph or anything else—becomes widely circulated, it must be regarded as possessing popularity. The "carte" has achieved this condition in the highest sense, and it is most probable that the size, being such as admitted of an easy and convenient means of transit through the post, had no small influence in bringing this state of things about. The cabinet, on the other hand, is extremely likely to become injured when enclosed in a letter, and its additional cost in very many cases weighs against such a large distribution as professional photographers so much desire. Between the carte and cabinet there was introduced some years ago a size that, at the time, pleased all who saw it. The name given to it was the "Victoria," and many readers will remember that its dimensions were, as nearly as possible, midway between the sizes just before alluded to. For some reason not perfectly understood, the public, who were rapidly interesting themselves in this new size, found to their dismay that album makers resented the intrusion, and, as a consequence, the demand soon ceased altogether. This we regard as an unfortunate circumstance, for there are periods when the public appear to tire of a particular fashion in anything, even though it possesses the convenience and utility which has been universally recognised in the *carte*, and they look to photographers for the introduction of something more strikingly novel than improved composition, variety of pose, or altered designs in style of mount. The present Jubilee year would be an opportune time to re-introduce the Victoria, and should this be done in a business-like manner, we do not think photographers or their patrons will have much cause of complaint. A Victoria can be enclosed in an ordinary letter, but its principal chance of success in rivalling other sizes rests in the hands of the stock dealers.

Notes.

Phototype blocks for reproduction of photographs are being extensively introduced into Italy by Victorio Turati of Milan (21, Via Bramamte), who sends us a magnificently illustrated catalogue, which includes exceptionally fine reproductions from paintings, sculpture, and natural scenes The future of photography seems to rest largely with the block method ; and we may mention that Turati's blocks show the linear grain, like those of Ives.

Before the Abbey was in any way touched with a view to its restoration to its ordinary condition, a series of photographs were taken of its interior in what may be called its Jubilee state. These photographs will doubtless be of use to Mr. Lockhart, the Scotch artist, who is painting the scene in the Abbey on the 21st ult., "by command." Photographs of most of the "royalties" and other distinguished persons present will also be available ; but personal sittings have been already given in many instances, and others will be granted in due course.

We alluded last week to the Dover innkeeper who had sent his photograph to Her Majesty because, he alleged, he was the heaviest man in her kingdom. But his act has, it seems, aroused into antagonistic rivalry a large number of other heavy subjects of the Queen, who refuse to admit his superiority, and so bitter is the dispute waxing, that it is not impossible that the point in dispute may find its ultimate settlement in a public trial, an enterprising proprietor having already offered a suitable arena in which the rival Jubilee fat men can be publicly weighed.

The so-called "silly season" has not yet commenced, it is true, but we are none the less inclined to suggest that the following intimation—which, need we say, was first conveyed to the public in an American journal?—has been prematurely published, and should have been kept back for at least two months longer. Without printing at length the details given in the paragraph in question—which, by the way, are Defoe-like in their realistic minuteness, we may safely give the gist of them. It is stated, then, that the editor of a Chicago newspaper, already distinguished for its enterprise, is determined to outdo, if possible, his New York contemporaries ; and with this purpose has just fitted out at great expense what he calls a "Photographic Yacht," the said craft having been fitted up under the superintendence of a well known American photographer, with every appliance likely to be useful in what is meant to be a voyage of photographic research. Three skilled photographic operators are to be on board, and the main object of the cruise, let us at once add, is the sighting and photographing of the great Sea Serpent itself.

It is further stated that, in addition to the high pay the yacht's company will receive, a special premium has been promised to each member of it in case a successful negative of the desiderated monster is secured. It is to be discovered at any cost, indeed, just as Doctor Livingstone was some years since discovered by Mr. Stanley on account of the *New York Herald;* and if completeness of outfit and display of photographic foresight meet with their due reward, the gigantic saurian of the sea may consider itself as good as "taken" already—of course, in a photographic sense. It may be interesting to add that the photographers in search of the sea serpent will not confine their attention solely to this mysterious water snake. They are expected to "take a shot"—this term is also used in its photographic sense—at any passing mermaid, manatee, Flying Dutchman, or other phenomenal object, they may get within focus. It is also reported that a captain of New Haven, Connecticut, whose brig was chased by the sea serpent off Cape Chesapeake two summers since, has been engaged as skipper of the Chicago editor's yacht, whilst for first mate Mr. Hiram S. Bengafield, of New Troy, near Springfield (Mass.), has been secured ; and the relevancy of this appointment will be recognised. When we add that Mr. Bengafield is the lucky mariner who, on or about the 1st April, 1886, was defied, so to speak, in mid-ocean by an elongated sea monster, provided by beneficent nature with a long mane of pea-green hair, and also (as stated in Mr. Hiram S. Bengafield's affidavit) wearing a palpable crown ; when we add that a cargo of specially prepared dry plates of exceptional size have been already shipped ; and that for the convenience of the photographers a large camera will be kept ready, and run up to the "maintop," we have said enough, we think, to invest this expedition with unusual interest.

A correspondent writes : "Your story of the cyclists who, attempting to take the photograph of a tramp, were themselves taken in to the tune of eighteenpence, reminds me of an experience of my own. I was tricycling to Margate just before the hopping season last year, when the Kentish roads are infested by tramps of all sorts and conditions. The camera I had attached to my machine came in for a good deal of rough chaff, but I did not accept the numerous offers of patronage I had, including one to take a dozen—sitters, not photographs—for fourpence. Two evil looking fellows one day annoyed me

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much, not only by their proffered friendship, but by the way they dogged my wheels. There are a good many hills in the particular part of Kent where I happened to be, the road was heavy, and the fellows, with the assistance of short cuts, managed to keep up with my machine. At last, after about two hours of this annoyance, an idea occurred to me. I put the spanner of my tricycle in my side pocket, so as to show the end, which, in the uncertain light of the evening, looked like the barrel of a revolver. When next the fellows came near I leisurely got off the machine, stuck my hand ostentatiously in my pocket, as if to grasp the supposed weapon, and looked the torments full in the face as they came up. Not a word passed : they slunk by, and I never saw them again."

The portrait of the Queen on the new coinage is a decided failure. It was executed from sittings which the Queen gave to Mr. Boehm for the purpose. The portrait on the Epping Forrest medal was modelled from photographs, and is considered a far better likeness. The artist in the former case has attempted to improve nature and repair the ravages of time. In the words of a contemporary, he "has planted a middle-aged head on a swan neck and youthful bust." Her Majesty may like this—indeed, we may presume that portrait received her approval before it was adopted—but those who use the coins would have preferred something more like the photographs they are accustomed to.

The *New York World* offers, as an inducement to subscribers, a complete photographic outfit "packed in a strong carrying case," and perfect down to the smallest detail. Anybody who is not a subscriber and wants the outfit must pay ten dollars ; those who pay one year's subscription can have the apparatus with the paper thrown in, or the paper with the apparatus thrown in, just as they please to value the one or the other. But there is something beyond this, for "special terms" are offered "to agents and subscribers who secure new subscriptions." Amateur photography must be in the ascendant in America when a daily paper puts forward this announcement.

Life has a column devoted to physiognomy. All you have to do is to send your photograph, a stamped envelope and sixpence, and in a fortnight's time you read "a full, true, and particular account" of your character. Why does not the enterprising journal add palmistry also to be interpreted by the aid of photographs? The only precaution necessary is that the physiognomist should be the professor of palmistry as well. It would be a little awkward if the two experts, one reading the photographed face, and the other the photographed hand, arrived at totally opposite conclusions.

An American firm evidently has faith in the revival of the stereoscope, since it has opened a stall in the West Kensington Exhibition for the sale of slides, and of a new and cheaper form of instrument. The shape has no advantages in convenience over one introduced many years ago by Meagher, unless the superiority of cheapness.

SOME PHOTOGRAPHIC HERESIES.

BY CHARLES TRUSCOTT.*

ANY photographic theory or opinion opposed to the generally accepted one, may be called a kind of heresy, and the heresy of one year frequently becomes the orthodoxy of the next.

The average professional photographer is generally a very conservative individual, slow to accept anything new, or to adapt himself to a new order of things, and yet possessed of more than the average share of ingenuity. This conservatism may arise from the scarcity of writers on photography who are good at making photographs. many of our best photographic writers being proverbially but indifferent photographers ; the consequence of this is a large proportion of very fine writing, not without its value to the art-science, perhaps, but which is either misleading or ridiculous to the practical worker. Correct theory is, of course, very useful to the intelligent workman ; but a false theory is neither ornamental nor useful, and a theory founded on imagination or superficial experiment is very apt to be false.

Many of us can remember when a collodio-bromide and geletino-bromide emulsion experimentalist was regarded as a kind of fanatical searcher for the photographic philosopher's stone, and the possibility of producing a dry plate to equal wet collodion in sensitiveness was looked upon as on a par with photography in natural colours. The journals were half-full of the heresy of emulsion photography, but nobody but enthusiasts would read such rot, until Charles Bennett announced photographing an interior by gas-light, and, what was more, showed the results before one of the London photographic societies, when the photographic world began slowly to awake to the fact that it was on the eve of a great photographic revolution. Then, as there was no denying the rapidity of the new gelatine dry plates, those who had mastered the wet collodion process, but had not the energy or ability to acquire at once the skill to do as good work by the new process, naturally blamed the process, and denied the possibility of its producing such good results ; and there still are plenty of photographers who profess to believe the same. When steel pens were introduced, there were for years many who still clung to the old scratching quill pen, but it was buried with them. I propose to let wet collodion, for negative-making, bury itself, having been among the first to dispense with it for that purpose.

Gelatine Plates.—Photographers generally are afraid of a very rapid plate for general work ; they say that qualities such as sparkle and latitude have to be sacrificed to rapidity. I do not believe a word of it. I hold that a good rapid plate is capable of doing all that a slow plate is, and much more beside. Then why ride a mule when you may have a good horse for the same money? It is like some beginners I know who were very anxious to possess a lens of great rapidity ; they obtained one, but never, under any circumstances, think of using it with any but the smallest diaphragms. They have two good legs, but are afraid to walk, and so hop about on one ; or they may be likened to a man who uses steam power—when his boiler has been tested to 400 lbs., running with safety at 100 lbs. pressure, he is afraid to work at more than 25 lbs., and, as a consequence, is always short of steam to drive his engine and machinery efficiently. How many photographers are there who take full advantage of the great rapidity of the modern dry plate of to-day? Very few. Indeed, I hold they cannot do so with the appliances which are on the market to-day. Sometimes we are told that "gelatine has ruined the business." What! enlarging the scope and power of photography has ruined it! Did the collodion process ruin photography? It ruined the Daguerreotype process ; but photography? Not much. Gelatine may, and will, supersede collodion for negative-making. It cannot ruin photography, but is a new power and blessing to the photographer and the world, and we do not yet know half its capabilities.

Development.—Another heresy of mine is concerning development. Development is not the simple matter some people would have us believe. It is a little science in itself, and not to be learned in a year. Now it is generally understood that slow development is the best treatment for a minimum exposure. My practice is directly opposite to that, inasmuch as I invariably use the most energetic developer I can compound, and the plate will stand for such a case. I have no faith in homœopathic development as a remedy for general debility in the latent image. Did we use a weak developer for under-exposure on wet collodion plates? No; but both strong and hot, because it was right in theory and practice.

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* Read before the Photographic Society of Philadelphia.

The amateur photographic epidemic is regarded by many professional photographers with a great deal of misgiving. Some even go so far as to say, "Amateurs are ruining the business." Now, I have had considerable opportunity of forming a correct opinion on this point; and while I admit there is a certain class of mercenary plate spoilers, calling themselves amateurs, who expect their camera to earn its own fodder, or who go to Florida, or some other health resort, with the intention of making photography pay part of their expenses, yet I do not admit that calling themselves amateurs will make them such, in any sense of the word. They are professionals, to all intents and purposes, for the time being—professional quacks, sailing under false colours. I have no doubt that they do some little injury to the business by cultivating the popular idea that photographs do not cost much to make, and that if a man has good instruments and plenty of light, he has every requirement to make good photographs. This idea the genuine amateur is doing yeoman service to correct. See how he is educating the public taste to discriminate between good and bad photographs. Then look at the number of those who buy expensive instruments, and yet never, or only after much experience, produce good photographs. Is not that teaching the public (what they are slow to learn) that skill is an important factor in the production of good photographs? And when the public are able to recognize the qualities of photographs, and appraise them at their intrinsic value, then the profession will be ruined to all incompetency, whether called amateur or professional, and the skilled workman will find his hands full and prices good.

I was out with my camera a few days ago, and a gentleman came by and asked, pointing to the camera, "What sort of picture does that make—clear?" I must confess he did not make himself clear to me, so I answered, "That is for making photographs." He said, "But does it make them clear?" I replied, "That depends on how it is used. It is a question of skill, not tools. One man will carve better with a penknife than another will with the finest set of carving tools." While I possess the most complete outfit probably in this city, and set a high value on it, I should be foolish to expect my work to be good simply because I possess good tools.

Let us take a comprehensive view of this subject, and see how it looks from a distance in a good light. The universe, and all contained therein, visible and invisible, has to be photographed. Who is to do it? We professionals cannot begin to do it; it is much too large a contract. Then what are we to do? Are we to be like dogs in the manger, or cheerfully recognize the valuable service our amateur brethren are rendering in this work? How much, do you think, of the work done by amateurs would come to the profession? Less than one-tenth—that is to say, more than nine-tenths of the work done by amateurs would never be done if they did not do it. Then let us not forget the splendid services amateurs have rendered the art science in the past. Surely they have earned their diploma. Then away with petty jealousies, and such old cries as "The craft is in danger!" If the craft is in danger, it is from within, and not from without; and it will generally be found that the most jealous are the incompetent—those who have no special skill to rely on.

There is a general superstition in the profession that a north light is a necessity for a portrait studio. In fact, I very much doubt if there is a south skylight in this city. See the trouble they have gone to all down Arch and Chestnut Streets, to obtain a north light; they have had to either build over two houses, or spoil the length of the studio. Now I have worked under many skylights, and prefer a south light every time.

Speaking of portraiture, a portrait combination lens is supposed to give great roundness of image; of course, opticians favour this view, as well as many photographers. My opinion is, it is a question of lighting, and has little or nothing to do with the lens.

Mr. Burton has lately been finding fault with the term "depth of focus," but he does not suggest a better. He says it is impossible that more than one plane can be perfectly defined at once by any lens, no matter how small the diaphragm used. Truly, we are getting things down very fine. Why did he not go further, and object to the term "flatness of field," because no lens has a perfectly flat field? Why did he use the term "perfect definition," when he knew that the correction of all photographic lenses is a compromise, and that the photographic lens has not yet been made perfectly free from astigmatism? Consequently, there is no such thing as perfect definition. I notice some writers on photographic optics have lately been using the term "penetration;" but is it any improvement on "depth of focus?" I think not; besides, it is not nearly so expressive. The English language is a very good one, but, like many other things, is not quite perfect.

Another heresy of mine is that every live photographic society should have a standing committee, which may be called the "Research Committee," composed of three experts, who should, if possible, be, either individually or collectively, skilled in photographic chemistry, photographic optics, and mechanics, with power to add to their number for special work. They should report at each monthly meeting on such matters as might have been referred to them, or in their judgment they may deem worthy of investigation. One part of the order of business should be "Report of Research Committee." A question may be asked which no one is able to answer, such as "Is chloride of sodium a restrainer or an accelerator?"—referred to the Research Committee." An optician brings out a new lens or a new invention, or a plate-maker a new plate, for which they claim certain possible or impossible qualities. Knowing a society has a competent Research Committee, samples are forwarded for examination, and the reports of such committee would be of great value to the members and the photographic world.

I have heard it stated, on good authority, that a diaphragm which expands and contracts during exposure would not give good definition with a single lens; but, having tried it, I can say it is a mistake, for it does not injure the definition in the least, but improves it.

J. Traill Taylor, in a lecture on lenses recently, proposed as a corrector for single lenses a pair of common, cheap lenses, to be placed near the diaphragm; one a periscopic, of short focus, and the other a concave lens, of the same focus. I have tried it, and having no focus, it has no effect, as we might expect. This gentleman is usually so very accurate, especially in optical matters, that I am the more surprised he should make such a suggestion without having first tested it. I was speaking of this to a gentleman whom you all know, and he said, "Have you seen my plan of doing that?" I answered, "No; what is it?" He said, "You are aware that a square diaphragm gives cushion-shaped distortion." I replied, "I did not; but I did know that placing the diaphragm behind the lens gave that form of distortion." "Well," he said, "a square diaphragm gives it too; now I make a round diaphragm, and outline a square outside of it, and in each corner of the square I cut out a triangular aperture; which will give a rectilinear picture." I tried the square diaphragm, and found it did not give the cushion distortion as stated, so did not think the other was worth trying, as the distortion is not influenced by the shape of the diaphragm, but by its position. I think the single lens has a great future before it, however some may despise it.

One article of my photographic creed is, I believe in the capabilities of a plate of the most exalted sensitiveness, the largest diaphragm, and the shortest exposure that will give the amount of detail and definition desired.

PHOTOGRAPHY, PAST AND PRESENT.

BY EDWARD DUNMORE.*

Modern photography, especially in the field, is free from nearly all the troubles and annoyances of wet plate work. There is, in fact, no more, perhaps even less, than that attached to water-colour sketching. Under such conditions all the photographer's artistic nature ought to be fully exercised, the art side of photography occupying his entire attention. Making a negative, so far as the necessary field work goes, is no trouble. Anybody can do it, but (and there is a good deal in a "but" sometimes) there is in making a picture. I look on it that as soon as proficiency is gained in the necessary manipulations—and they are but few—the whole thoughts of the photographer should be concentrated on the artistic rendering of anything he may attempt to portray. A plate should never be exposed unless there is a fair probability of a picture resulting in the subject chosen. That very common plan of dubbing a failure a study because it is scarcely worth calling a photograph, and certainly is not a picture, is to be deprecated. Sooner bring home your apparatus unused than that the plates should have been exposed indiscriminately on any building or subject that happened to present itself, for, bear in mind, one thoroughly good and artistic negative is of more value and will afford more gratification than any number of indifferent ones. The beauty of a good negative grows under frequent inspection, and the faulty one gets more and more disappointing. (It must be understood I refer especially to the capabilities of the negative for producing a good print—its ultimate use— and not merely to the negative itself.) It is not always the prettiest negative that gives the best prints. However, a thoroughly nice-looking negative does not often disappoint one. Let any amateur ask himself what is his percentage of medium and indifferent negatives out of a day's work, and how many artistic and fine compositions, such that some possible and easily-made alteration at the time they ware taken would not improve, could be chosen out of a year's work. I am afraid the result would be unsatisfactory.

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* Continued from page 396.

The low percentage of good work is in some degree due to the anxiety to fire off plate after plate at anything, without considering if the object is worth the plate. If all who take up photography as an amusement tried to make *pictures* instead of only sharp negatives, we should soon see an improvement in the work. It certainly requires education of the faculty of seeing, even to see a picture. Many will go through a most picturesque neighbourhood and never see anything at all, whilst others will in a far worse locality see a picture at every turn. This training of the eyesight may in a great degree be self-accomplished by the careful study of the works of artists of repute, and at the same time making a mental analysis of them by endeavouring to ascertain the why and the wherefore of the position of the various objects, the arrangement of the light and shade ; for in all good pictures there is nothing put without a purpose, and nothing can be taken away without in some degree damaging the results. Again, every square inch in some pictures is a picture in itself, so well has the composition been thought out and harmonised in one glorious whole. It may be said that photographers are the creatures of circumstances, and cannot use such discretion in composition as the painter. This is true in a degree, but they have compensating advantages in their command of rendering detail and the power of accurately registering evanescent effects, which are far in advance of any possible hand work. There are undoubtedly subjects that photography fails adequately to represent, also an unlimited number that can be properly rendered, and where painting and photography are on more of an equality as truthful recorders of nature.

One kind of subject we have all been educated to falsely appreciate, and that is the magnification and undue prominence of distant objects. Artistic licence says it gives a better and more artistic effect to magnify the distance than to represent it accurately. Is this really so, or is it a matter of persistent error that familiarity has made us regard as truth ? There is no doubt that we generally look upon mountains and distant objects in photography as dwarfed simply because we have been used to see them painted on a scale perhaps more than twice as large as they ought to be. Unless the lenses we use are of exceptionally long focus, distant objects do not come up to our expectations as to size, and even then there is an impression that they do not look as important as they ought.

This effect is possibly owing to the aerial perspective in the negative being exaggerated, and the distances printing much lighter a tint than they should, and becoming technically known as buried ; but, whatever the cause, photography at the present time fails to give entire satisfaction on this particular point. We have, however, plenty of subjects that do give entire satisfaction, and the photographer shows his skill in selecting the most suitable. Here, then, we see the vast superiority of modern dry plates over wet collodion. Thousands of subjects were closed books to the wet plate man, that offer most tempting and novel effects quite within the range of the gelatino-bromide film. In going for an outing, he starts without the worry of having to take a laboratory with him and that awful bath, but, provided with a kit that can be put in his pocket or flung over his shoulder, is prepared for all emergencies and is independent of extra aid, his motive power is self-contained, to be exercised at discretion. This independence is in itself a wonderful aid to picture making, and in the wet plate days several attempts were made to provide apparatus that would permit it ; for instance, Dubroni's and Edwards's *graphogenic*, neither of which were pleasant to work with, although by chance you might get a tolerable result with either.

The modern photographer has much to be thankful for, and only he knows how much who has struggled with processes in the early days. I sometimes marvel how such good work could be done under such conditions, and a shudder passes through one to think of having to return to the old plans. However, to bring this prosy paper to a close, I would impress on all who indulge in the pleasures of photography that they should pay special attention to the artistic rendering of everything upon which they bring their cameras to bear. No matter how simple and unpretending, it will, if invested with real artistic qualities, be bound to please, when the most ambitious flight without this quality will be unsatisfactory and disappointing.

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.*

[*Reprinted from the* Photographic Times.]

The Calotype or Talbotype Process.—Fox-Talbot did not rest content with his early successes. After the publication of Daguerre's paper, in 1839, he tried the iodide of silver instead of the chloride ; and above all he succeeded in discovering a method of development by which the time of exposure necessary to secure a picture was very greatly reduced. In Talbot's early experiments the sensitive paper had to remain at the back of the camera until the image was printed-out upon it by the action of light ; and for this a good light and a long period of time were necessary. But in September, 1840, Talbot states he discovered that if the sensitive paper be brushed over with a mixture of gallic acid and nitrate of silver, and be then exposed, while still wet, within the camera, the time necessary to secure a picture is only two or three minutes. He also found that the paper might be dried and exposed in that state, the image being subsequently brought out or "developed" by brushing over it more of the "gallo-nitrate of silver" solution.

Reade Independently Discovers Development by Gallic Acid.—It is tolerably certain that in the system of development described in the last paragraph, Talbot had been anticipated by a few months by the Rev. J. B. Reade. We have seen that Wedgwood had noticed, some forty or fifty years before the time of which we are now speaking, that copies by light were produced most rapidly when leather was used as a support for the salts of silver. Reade also found this to be the case, and as his inroads upon his wife's stock of white kid gloves were not unnaturally objected to by that lady, he was led to the discovery that the increased sensitiveness to light was due to the solution of nut-galls with which leather is impregnated during the operation of tanning. Finally, he secured in what may be termed the essence of the galls—gallic acid—a substance capable of strengthening or developing the invisible, photographic, or, as it was then termed, the latent image, which is formed, after even a very short exposure, upon the surface of the sensitive paper within the camera.

Talbot Patents the Calotype Process.—Talbot patented his calotype (beautiful picture) process in February 1841. It is the third British patent for photography, the two previous ones being for the Daguerreotype process. The calotype process was also frequently called Talbotype, in honour of the discoverer. The patent was afterwards disputed in the law courts, on the ground of "previous discovery" by the Rev. J. B. Reade ; but it was upheld by the judge mainly for the reason that Reade did not properly publish or make known his discovery.

Outline of the Calotype Process.—The papar was carefully selected, of a close, even texture and fine surface. A solution of nitrate of silver (100 grains to six ounces of water) was brushed over one side of the paper and allowed to dry. It was then dipped into a solution of potassium iodide (500 grains to one pint of water), where it was left for two or three minutes. During this time the iodine combined with the silver to form iodide of silver. Lastly the paper was rinsed in pure water and dried, when it was seen to be covered with a pale yellow coating of iodide of silver, which in that condition was practically unacted upon by light.

When it was desired to use this calotype paper, it was taken into the dark room and brushed over with "gallo-nitrate of silver," made by mixing a solution of nitrate of silver (50 grains to the ounce) with one-sixth its volume of strong acetic acid, and adding an equal quantity of a saturated solution of gallic acid. The paper so prepared might be used wet, or it might be dried and kept for use at some future time. In either case the picture could be subsequently brought out by brushing more gallo-nitrate of silver over the exposed surface ; though, if the paper was exposed while still wet, this was not absolutely necessary. Finally the picture was fixed by well washing, first in water, then in a solution of potassium bromide or some other soluble bromide, and then in water again.

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* (Continued from page 282.)

In a patent taken out in 1843, Talbot claimed the use of a hot solution of "hyposulphite of soda (or any other soluble hyposulphite)," to give increased whiteness to calotype and other photographic pictures, and at the same time make them more permanent; but this claim was quite indefensible, since Sir John Herschel had announced the power of this substance to dissolve the salts of silver as early as 1819, and had again called attention to its value for this purpose in 1840.

Photographic Negatives and Positives.—Niepce found that in the pictures obtained on his resinized plates, the lights and shades were just the reverse of those of nature; the whitest parts of the original objects being represented by the dark surface of the insoluble bitumen, while the shadows were indicated by the bared surface of the metal plate beneath. In the same way Talbot found that the brightest parts of any landscape were represented by black patches of reduced silver upon his sensitive paper, while those parts of the paper upon which little light fell (the dark shadows, &c., of the landscape) remained white. Thus the developed image upon a sheet of calotype paper was the exact reverse, as far as light and shade were concerned, of the objects depicted. To such a picture Sir John Herchel gave the name of a *negative*. But paper is a semi-transparent substance, and by oiling or waxing it its transparency can be greatly increased. This fact, combined with the reversed nature of the original, enabled Talbot to obtain copies of any negative by placing a piece of sensitive paper underneath the negative, and then exposing it to sunlight. The rays of light passing through the clear or white parts of the negative blackened the paper beneath. After a sufficient time had elapsed the lower sheet of paper was removed, and it was then found to present a correct picture in black and white of the original objects. To such a copy Herschel applied the name of *positive*. It is obvious that in this way any number of positives could be obtained from a single negative, and in this respect the calotype process had a great advantage over the Daguerreotype.

Publication of the "Pencil of Nature."—In 1843 Fox-Talbot visited Paris, lecturing on his calotype process to large audiences, and instructing the Parisian photographers in his method. To make generally known its capabilities, he began, in 1844, the issue of the "Pencil of Nature," a book which appeared in six parts containing twenty-four calotyps plates, between 1844 and 1846; it is a handsome quarto, and was sold for three guineas. This book is now very scarce, but in all the various copies which I have examined the pictures are more or less faded, the fading extending gradually from the edges to the centre. The fact is that the necessity for a very thorough washing of each print to free it from hyposulphite of soda was not fully recognised in those early days of the art.

Later Work of Fox-Talbot.—After the introduction of Archer's collodion process in 1851, Talbot devised a modification of it by which he obtained instantaneous pictures, as those are called which receive an exposure of a fraction of a second only. Perhaps the experiment which he performed in the lecture room of the Royal Institution in proof of his success has never been surpassed. Fastening a page of the *Times* nawspaper to the edge of a revolving wheel, a clear photograph of every letter was obtained by the aid of the electric discharge of a battery of Leyden jars. Now it is known that the brilliant spark of light produced by such a discharge does not continue for more than the ten-thousandth part of a second.

In 1852, Talbot invented a process of engraving on steel plates by the action of light upon a surface composed of gelatine and bichromate of potash, to which he gave the name of photoglyphy. About 1854 he introduced albumen to give a gloss to the surface of the paper on which photographs are printed.

Defects of the Calotype Process.—It is hardly possible to overrate the difficulties which photographers had to contend with half a century ago. Many of these difficulties were extraneous to their art. Thus hyposulphite of soda was, in 1840, a chemical curiosity, and for years afterward its price was six shillings per pound.

The calotypists were especially at the mercy of the papermakers. Canson, in France, and Turner, Hollingworth, and others, in England, made good paper, but still the grain was perceptible, and it was frequently uneven, knotty, and speckled with particles of metal from the machinery of the paper mills. Then it was difficult to get the paper to lie flat in the dark-slide; and its comparative opacity made the negatives print slowly. To remedy the latter defects, the French experimenters, Le Gray and Blanquart-Evrard, introduced, about 1850, the method of waxing the paper by dipping it in melted wax and then ironing it between sheets of blotting-paper. This made the paper more even in texture and very translucent. It was then sensitized, exposed, and developed in the usual way.

Light for the Dark Room.—From the moment that the silvered plate of Daguerre, or the sheet of paper used by Talbot, was fully sensitized, it became impossible to expose it to ordinary light. The only white light allowed to fall upon the sensitive surface must be that which passes through the lens of the camera, and by that light the image is imprinted on the film containing the silver salt. But it is impossible, or at all events most inconvenient, to go through the operations of sensitizing and developing the plates in utter darkness. Here the fact discovered by Scheele, in 1777, comes to our aid. He found that red light produced no chemical effect upon the chloride of silver; and, speaking of the ordinary salts of silver employed in photography—the chloride, the iodide, and the bromide—it may be said that they are unaffected by pure red light. Even yellow light has little or no effect upon these substances if they are contained in collodion; but when bromide of silver in gelatine is tested in the same way, a few minutes' exposure to strong yellow light will be found to produce a change. Capt. Abney, however, has recently prepared bromide of silver in such a molecular condition that it is strongly affected even by the red rays. Speaking generally, however, we may say that no harm is done to the sensitive surfaces ordinarily used by the photographer by a few minutes' exposure to red, or even orange light, and this space of time is sufficient to enable him to perform the various operations which are necessary. I have elsewhere recommended the use of covers of red card-board for all the flat dishes in which sensitive plates, or paper, are manipulated, and by using trays fitted with lids of ruby glass, it is quite possible to develop plates in any ordinarily lighted room. Thus the photographer's "dark-room" would be more properly called the "red-room," for its windows are usually glazed with ruby glass, and its gas-jets and lamps fitted with ruby globes.

In 1844, Claudet actually took out a patent for the use of red light in photographers' dark rooms; but he does not appear to have attempted to enforce it. During the collodion epoch (1851-80), yellow light was generally employed to develop by. For our gelatine dry-plates, either an orange or a ruby-coloured light is preferable.

Contrast between Daguerreotype and Talbotype.—For ten or twelve years after the publication of the discoveries of Daguerre and Talbot, their processes—so distinct in method, although aiming at a like result—held joint sway over the little world of photography. By professional portraitists the Daguerrotype process was preferred, owing no doubt to the clear sharp pictures and beautiful detail which could be secured thereby; in part, also, their preference may have been due to the high prices which were cheerfully paid for pictures on "plates of silver;" two guineas each was the ordinary price for quarter-plate portraits, and four guineas each for half-plates, as late as 1854. Amateurs on the other hand, usually employed the Talbotype process; it was less expensive, less cumbrous, and permitted of the multiplication of the results obtained—for one good negative would furnish a large number of positive copies.

Herschel Introduces Glass Plates.—Photography is indebted to Sir John Herschel for many great improvements. The "famous son of a famous father" was born in 1792, and was therefore in the zenith of his powers at the time of Daguerre's discovery. He immediately suggested the use of glass plates as a support for the sensitive salts of silver; recognising in the transparency, rigidity, and cheapness of glass, together with its indifference to the chemicals employed, properties of the highest value in photography.

Herschel's plan was to place his glass plates at the bottom of a vessel containing finely-divided silver chloride in water. The white silver salt was slowly deposited, in a uniform film, upon the upper surface of the glass. The water was then syphoned off, and the plate dried and exposed in the camera. The images obtained in this way were, however, very faint, and although some success attended Herschel's attempts to intensify them by electro-deposition, still good prints could not be obtained. At that time it was not known that silver chloride is unaffected by light, unless there be some substance mixed with it which is capable of attracting and combining with the chlorine which is liberated, under such conditions, by the action of light.

The Albumen Process on Glass.—Niepce de St. Victor, born 1805, died 1870, nephew of *the* Niepce, improved on Herschel's plan by recognizing the fact that it is necessary to coat the glass plates employed in photography with a film of some suitable substance, in and on which the particles to be affected by light may rest. For this purpose he employed albumen, beating up white of egg with potassium iodide (20 grains per egg), potassium bromide (four grains), and common salt (two grains). The clear liquid so obtained was poured upon the glass plate, dried, and heated until the albumen hardened and became insoluble. It was then dipped into a bath of silver nitrate, where a chemical change took place, resulting in the formation of iodide and bromide of silver within the pores of the albumen. The plate thus sensitized could either be exposed while wet in the camera, or it might be rinsed, dried, and kept in a dark place till wanted. Development was effected by brushing a solution of gallic acid over the albumenized plate. This process was published in 1848, and improvements in it were quickly effected by two other French investigators—Blanquart-Evrard and Le Gray.

This albumen process was a considerable advance. The transparency of the glass permitted the production of positive prints at a rapid rate; while the clear and delicate film of albumen furnished a capital medium for holding the molecules of the sensitive silver salts, and securing their adhesion to, and equal distribution over, the surface of the plate. It is a mistake, however, to suppose that such substances as albumen, collodion, and gelatine, are nothing more than vehicles in which the sensitive molecules are contained. They each exercise an influence —differing in degree—upon the silver salt imbedded in them, by which the decomposing action of light is facilitated. In Great Britain the albumen process was practised successfully about 1850, by Messrs. Ross and Thomson, of Edinburgh, whose pictures of architectural subjects on plates fifteen inches square were greatly admired. Many travellers also used dry plates prepared on this system. Its chief drawback was the length of exposure necessary—from five to twenty minutes under ordinary conditions.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

9068. Georges Carette, 45, Southampton Buildings, London, for "Improvements relating to magic-lanterns."—June 25, 1887.

Patent on which the Ninth Year's Renewal Fee of £10 has been Paid.

2800 of 1878. W. Willis, Junior.—Photo-chemical printing.

Official Abstract of Accepted Complete Specifications.

Boult (Crocker). 7790, 1887. "Cameras [including lenses and lens fittings]".—Folded paper camera with sensitive plate and pinhole lens.

Edwards (Koppe and Moh). 6032, 1887. "Change boxes and slides."—Plates in flexible bag with metal frame round mouth which fits to bottom of slide.

Urie and Urie. 10,770, 1886. "Printing, colouring, and finishing."—Automatic printing machine: sensitive paper drawn intermittently under negative by mechanism regulated by clockwork.

Specifications Published.

9886. James William Thomas Cadett, Photographic Chemist, 84, Grove Lane, Camberwell, London, for "Improved arrangements for coating glass or other surfaces used as a support for photographic emulsions."—Dated July 31st, 1886.

The patentee says—My invention is intended for coating glass, or other surfaces, used as a support for photographic emulsions, where such coating is done on travelling or moving surfaces in one direction. My invention is particularly applicable to the tables or setting surfaces now in use, where a cord or cords, or chain or chains, or band or bands, or other moving surfaces or arrangements carry the glass, or other surfaces to be coated, in one direction while being coated.

My invention has for its principal object: Firstly, the even spreading of the photographic emulsions on the surfaces to be coated, after the photographic emulsion is laid down, not necessarily evenly to begin with, on the surfaces to be coated; and Secondly, means for ensuring a proper and unfailing delivery of photographic emulsions to the surfaces to be coated.

In combination with the above mentioned tables or carrying arrangements for the surfaces to be coated I use a rod or rods, or surface or surfaces, or tube or tubes, arranged so as to rest across the surfaces to be coated without touching such surfaces to be coated excepting at such points or places as may be necessary to support such rod or rods, or surface or surfaces, or tube or tubes.

The rod or rods, or surface or surfaces, or tube or tubes, is or are arranged at such a suitable distance from the surfaces to be coated that when photographic emulsions are put on the surfaces to be coated, and are carried by the above-mentioned tables or carrying arrangements under the rod or rods, or surface or surfaces, or tube or tubes, the photographic emulsion is spread by capillary attraction across the surfaces to be coated, and thus a practically even film obtained.

For putting down a suitable and proper amount of photographic emulsion on the surfaces to be coated, I prefer to use an open chamber with a series of plugs or valves, such plugs or valves when in use being kept in action by suitable power so as to intermittently and continually open and close, and thus lay down a suitable quantity of photographic emulsion, such above mentioned chamber with plugs or valves being filled to a suitable extent with photographic emulsion, and such chamber being placed in suitable position over the surfaces to be coated. Arrangements can be made to keep such chamber warm by fire, hot water, or hot air or gases, and the above-mentioned rod or rods, or surface or surfaces, or tube or tubes, can also be kept warm by hot water, or hot air, or gases passing preferably through it or them.

6353. The Honorable William Grimston, of Gorhambury, St. Albans, in the county of Herts, Retired Commander in the Royal Navy, for "An improved appliance for use in treating and washing photographic prints and plates."—Dated April 30th, 1887.

The patentee says—According to my invention I provide a tray or receptacle of any suitable shape, but made of perforated or reticulated material, such, for example, as perforated sheets of galvanised iron, or woven wire work, or papier mache, or earthenware with a number of perforations therethrough.

Into this receptacle the prints or plates to be treated or washed are placed, and in such treatment or washing the water or liquid is caused to pass through amongst the prints and out from the receptacle; for example, the receptacle may be placed in any common baths and be withdrawn at intervals so as to cause the water or liquid to run out from the receptacle, and carry with it the matter which has been removed from the prints or plates, or by which the prints or plates have been treated, or the receptacle may, for washing purposes, be placed in a stream of water. My invention is especially adapted for large photographic prints on paper, as the receptacle can be taken with the prints in it from bath to bath, from beginning to end without handling, thus obviating the chance of tearing the paper.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is—

For and in treating or washing photographic prints and plates a perforated or reticulated receptacle through which water or liquids can be caused to pass without the necessity for handling the prints or plates, substantially as hereinbefore described.

4718. Charles Cusworth, 16, Ellington Street, Islington, in the County of Middlesex, Photographic Apparatus Manufacturer, for "Improved photographic camera."—Dated March 30th, 1887.

Consists of arrangments said—

1st. To facilitate the erection and closing down of that part of a photographic camera known as the front.

2nd. To expedite focussing.

3rd. To enable the front to be fixed at any angle to the base board.

4th. To facilitate the fixing of the rising front at any required distance from the focussing screen.

First of the said objects is aimed at by attaching the bellows of the camera to the front, and allowing the front to slide up and down a slotted frame provided for its support.

The second object is carried out by attaching the front to its supporting frame, which in its turn is attached to sliding pieces, and allowing the supporting frame to slide backwards and forwards in a carrying frame which has a rack and pinion movement attached to its underside, thus giving, by means of the rack and pinion action, a to-and-fro movement to the front.

The third object is of a twofold nature, and is carried out by (*a*) centring the supporting frame into the sliding pieces : thus allowing the supporting frame to rotate. (*b*) Attaching to the sliding pieces, and at a distance from the centre a slotted strip by means of a pin ; the said slotted strip extending upwards past the side of the supporting frame. A milled headed screw is attached to the side of the supporting frame, and slides in the slotted strip. By means of this milled headed screw and slotted strip the front may be held firmly in any desired position.

The fourth object is carried out by attaching to the side of the sliding piece a block on the under-side of which is an inclined plane. The fulcrum of a lever is also attached to the side of the sliding piece, and on the side of this lever is another inclined plane.

ON PRINTING BY ARTIFICIAL LIGHT.

BY F. BIRKETT.*

It is an advantage to amateurs on some occasions to be enabled to print from their negatives at night, or during the winter months. There are two kinds of paper one can use—the bromide and the chloride. The bromide is pretty well known in the shape of Eastman's, Morgan and Kidd's, Fry's, Marion's, and others ; but with all these only the black and white tones can be obtained. Many people say this looks too cold : they like something warmer, or more like the tone of the silver print on albumenized paper. By using the chloride you can get almost any tone you wish. Still preferring the ordinary silver prints, I use as a substitute the Alpha paper. I used Morgan and Kidd's contact paper till they discontinued making it.

The negative should be a good one, not too thin. On bromide paper, a thin negative will give a good print ; but with chloride, a plucky negative, as with silver printing, gives the best results. The light through one thickness of golden fabric is quite subdued enough to work by ; in fact, I have used the gaslight turned down just enough to see what I was doing—of course, keeping my dishes covered up as much as possible.

Exposure comes next. It is here you must decide what tone you want the resulting print to be. For a warm tone, give a long exposure and short development ; for a black tone, a short exposure and long development. A long exposure means two minutes—twelve inches from an ordinary gaslight. A dense negative requires much more.

The developer is the one given by the makers of the paper, viz., a weak iron one. Wet the prints in clean water, and place in developer (not too many at once). The picture comes out quickly. You will see how far to go. The print will alter but little in tone in the subsequent solution. Wash at once in a weak solution of citric acid, very weak, or it will fetch the picture off. Well wash, and tone in acetate toning bath with chloride of lime. You will not see much change in the colour. For myself, I leave them in four or five minutes.

Fix in the ordinary way, but they must be carefully watched, as they turn to a nasty yellow, and then brown ; the moment they reach the colour you require them, well wash in several waters.

All the water solutions must be cold. The face of the print can be glossed or polished by drying on ebonite or glass, cleansed with French chalk.

Correspondence.

WHAT OUGHT TO BE CHARGED FOR NEGATIVES ?

Dear Sir,—I consider that good quality negatives, specially produced for a publisher, 8½ by 6½, 9 by 7, or 10 by 8, should not be worth less than £1 1s. each, and that a further fee of £2 2s. per day be charged for expenses ; therefore the photographer alluded to in the News of yesterday's date ought in my opinion to be paid £16 16s. I shall be glad to learn the opinion of other photographers on this subject.—Believe me, very faithfully yours,

Monnow Street, Monmouth, June 25. R. Tudor Williams.

Sir,—Since you ask for testimony regarding the charges for out-door work, the following may be named as having been found to work well. A systematic charge is made of three guineas per day, with second class railway fare. Of course, the customer's first question is the very natural one, How many subjects will be taken ? And the reply is, All you can arrange to be conveniently taken in the time. One copy of each subject is supplied in the above charge. At first sight this may seem a little unreasonably liberal, but, as a matter of fact, it pays to take a good number of subjects. Additional copies are charged at a reasonable figure, and the orders for more abundantly pay for the little extra trouble and cost.

It is better to charge on a rule or system, if possible, rather than an arbitrarily fixed sum, though the latter may be anything but excessive. Benjamin Wyles.

Southport.

Dear Sir,—With reference to the four paragraphs under the head of "Notes," as to the charge for out-door work in your last number, I have no hesitation in stating my own terms. In the first place I should have charged twelve guineas for the twelve negatives ; to that I should have added rail and cab charges ; and then, as the distance travelled was doubtlessly the cause of the work requiring "two whole days," I should have charged five guineas for the second day.—Yours faithfully, Vernon Heath.

37, *Piccadilly, London, W., June 28th.*

[Our correspondent of last week who was offered £2 in payment for a dozen 10 by 8 negatives taken at a distance of eighty miles from the photographer's place of business, writes and informs us that his bill of £5 has now been paid. Benjamin Wyles, of Southport, who writes the second of the above letters on the subject, evidently has in view the supplying of prints or copies, and not the handing over of the negatives.—Ed. P. N.)

POISONED FINGERS — CHARGES FOR LANDSCAPE PHOTOGRAPHY—BUSINESS MANAGEMENT.

Dear Sir,—The experience of your correspondent anent poisoned fingers exactly tallies with mine.

A twelvemonth ago I had the same symptoms, and, although I found the irritation mitigated by rubbing vaseline into the hand before developing or toning, and wearing an old glove to prevent soiling the prints, yet I suffered more or less from the affection, until a month ago I mentioned it to my doctor (homœopathic), and he certainly seems to have cured me. I don't know what the affection was (nor the remedy), but the tickling sensations and scrofulous eruptions have disappeared, and I have not been to him since. I send you his card (Dr. Morrison, Belgrave House, Stockwell Road).

Respecting the London firm who wanted to pay £2 instead of £5, I think it opens up the entire question of photographic economies. Photography is between two stools : it has neither the uniformity of prices of a manufacturing business, nor the monopolised prices of pure "*art.*" Good average work has an *average* commercial value, apart from "name" or prestige.

I have often thought the commercial aspects of photography deserve discussion in your pages.

The articles on "Business Management" now running strike a right key, but they do not go far enough. I suppose it would not *pay* to send a census paper to all the principal photographers in the United Kingdom (they could be filled in anonymously if desired, or, at any rate, the names could be withheld from publication), giving hours of business (summer and winter) ; what holidays are allowed, and whether paid for ; what premiums are required with apprentices; what salaries are paid to beginners, efficients, and managers in each department; whether commissions are paid to employés, and on what basis; what prices charged for studio and out-door work, &c., &c., &c. W. Mountain.

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* Read before the Birmingham Photographic Society.

Proceedings of Societies.

Photographic Society of Great Britain.

A monthly technical meeting was held at the Gallery, 5a, Pall Mall East, on Tuesday last, the 28th instant, W. England in the chair.

G. L. Addenbrooke exhibited his travelling set, consisting of a three-fold tripod, camera in case, and minor appliances, after which Dr. L. Johnson called attention to the advantage of taking out each slide in a bag of waterproof cloth; light, dust, and damp being thus excluded. Dr. Johnson also exhibited a slide in which the plates are put in at the end, and spoke in high terms of the advantages of this arrangement. The ends of the springs, which tighten the plates against the rebates, project, so that when the door of the slide is closed the springs are tightened against the glass plates.

Professor Donkin exhibited a tourist camera, to the side of which was fitted a simple level consisting of a piece of straight wire suspended so that the bottom end of the wire hangs in the middle of a small screw eye when the camera is level. When a considerable wind is blowing it may be necessary to screen the wind off with the hand as the final adjustment is made.

W. England exhibited a tent of black cloth placed inside a tripod framework.

London and Provincial Photographic Association.

This Society met as usual on Thursday, the 23rd ultimo, W. E. Debenham in the chair.

After the confirmation of the minutes and some general conversation, several of the members left to attend the lantern show at the Camera Club. As those who remained had nothing of interest to bring forward, the Chairman announced that on Thursday of the Convention week, July 7, the Society would meet in the ordinary course; he then declared the meeting closed.

North London Photographic Society.

At the meeting held at Myddelton Hall, on June 17, J. Traill Taylor in the chair, G. McCourt and F. T. Parsons were elected members.

E. Dunmore then delivered a lecture on "Photography, Past and Present" (see page 410).

A. Pringle said that Mr. Dunmore had referred to a class of photographers who cared little for the artistic qualities of the pictures they produced, so long as they were technically good as photographs. There was, however, a class among amateurs who studied the artistic side and neglected the technical, and seemed to think if the composition of a picture was good that the quality of the negative was of little importance. He agreed with Mr. Dunmore on the importance of art in connection with their work, but at the same time thought too much stress could not be laid on the importance of thoroughly mastering the difficulties of development. No picture was ever the worse for the negative being technically perfect, and he thought that it should be the aim of every photographer to produce work perfect technically as well as artistically.

A. Mackie said that while he quite agreed with Mr. Dunmore on the importance of the art side of photography, he also agreed with Mr. Pringle's views as to the importance of a thorough grasp of the technics. He thought that amateurs often failed, especially in their attempts at portraiture, from their inability to keep their minds free from matters appertaining to the dark room at times when the whole attention should be given to the subject of the picture and its lighting and composition. Amateurs, too, were too often slaves to some particular form of developer, and made their exposures to suit that developer. This, he thought a wrong method of proceeding, as there was no developer that would equally suit every plate or every subject. The developer should be modified according to circumstances. He could not impress too strongly the importance of remembering that the lens only produced the picture as it appeared, and that therefore, until the plate was exposed, the undivided attention should be given to matters pertaining to the picture as a picture, leaving development for after consideration.

E. Clifton thought that we were too fond of trimming our prints to regulation shapes and sizes without reference to their suitability to the subject. Frequently a charming picture might be produced by taking a small portion from a plate which was unsatisfactory as a whole.

W. F. Cox said that the technical part of photography could be mastered by a little serious study. He thought that the art difficulty could only be met by a course of study in an art school.

Mr. Purton said that, in the Colonies, the silver bath was still used in many studios for portraiture, and in all for copying. Very excellent dry plates were now being made in Australia, but they seemed especially suitable for portraits, and did not give the vigorous image wanted for landscapes. He considered that the Colonists held their own in portraiture, but not in landscape work, but this was probably because the scenery was comparatively uninteresting.

Mr. Healey said he was probably the oldest photographer present. He commenced in 1847, and had first worked Daguerreotypes. He had also used the wet process, and had taken instantaneous portraits by it. Hill Norris's were the first dry plates he used, but later on he had made collodion emulsion. For some years he ceased to practise photography, but the conveniences of gelatine had induced him to take up again his old hobby.

J. Oakley spoke of the improvement in the picture to be obtained in some cases by taking a low point of view. He thought that many amateurs failed to do their best by attempting too many plates. He thought they should do less work, but it should be more carefully considered.

Next meeting, on Tuesday, July 5, a technical meeting.

Camera Club.

On Thursday, June 23rd, a varied exhibition of lantern slides was given. Several visitors very kindly accepted invitations to favour members with a view of their work, amongst these being J. B. B. Wellington, B. J. Wilkinson, W. England, and Major Nott. The members exhibiting were Messrs. Gale, C. B. Wright, Brownrigg, Clark, Ferrero, Dresser, Howlett, and Davison.

Two sets were shown by L. Wright, one including some very fine views taken in Norway, and the other representing scenes in North Devon. J. Gale and J. B. B. Wellington both exhibited some very fine slides, chiefly landscape and country scenes with figures.

F. Wilkinson sent by request half a dozen slides, which were bracketed with a similar number by Burton Barber to receive the highest award at the last annual competition of the Amateur Photographic Field Club.

W. England exhibited slides from negatives taken in Shew's fixed-focus detective camera. The transparencies were full of detail, and marvellously sharp throughout.

Slides made from some of Major Nott's fine negatives of animals taken in the Zoological Gardens were shown, as also some similar work by J. A. Dresser.

During the evening, some very handsomely got-up lenses called "star" lenses, just introduced here under the agency of Messrs. Hinton and Co., were handed round and critically examined. Attention was also drawn to photographs of the Jubilee procession taken by D. P. Rodgers and Lyonel Clark.

Club excursions for members and friends have been arranged for Saturday, June 9th, to Eynesford; Wednesday, June 13th, to Rochester; and Saturday, June 23rd, to Streatley and Goring.

Birmingham Photographic Society.

The monthly meeting was held in the Technical School, Bridge Street, on the 23rd inst., W. J. Harrison in the chair.

A. A. Atkins, G. Baxter, C. J. Jarvis, and R. L. Wareham were elected members.

A communication was handed in from the Meteorological Society asking for photographs of lightning from members who have taken or would take some when opportunity occurred.

H. W. Pickard read record of excursion to Millers Dale, when 107 pictures were taken.

A number of exhibits of photographs taken at the last excursion were shown by T. Birketts, Humphreys, and H. W.

Pickard, and some very fine instantaneous ones of the new steamer plying to the Isle of Mau by E. H. Jaques.

T. BIRKETTS then gave his paper on "Printing by Artificial Light" (see page 414). The paper was accompanied with practical illustrations.

DERBY PHOTOGRAPHIC SOCIETY.

THE members had an excursion to Cromford and Matlock on Saturday afternoon last, when some excellent negatives were obtained, the weather being favourable, and the attendance a good one. The excursion next Saturday will be to Millers Dale for Cressbrook Dale.

PHOTOGRAPHIC SOCIETY OF PHILADELPHIA.

A MEETING of the Society was held June 1st, President FREDERICK GRAFF in the chair.

The Committee on Presentation Pictures for 1887 reported that they had selected "On a Virginia Turnpike," by John G. Bullock, and "The Elephanta Caves, India," by Charles R. Pancoast.

The paper for the evening was read by CHARLES TRUSCOTT, the subject being "Some Photographic Heresies" (see page 409). The reading of the paper was followed by an interesting discussion of various points touched on by the writer.

L. COATES preferred to use plates slow enough to give several seconds' exposure, as with extremely rapid plates cap exposures could not well be given for such times as 1, $1\frac{1}{2}$, or $1\frac{3}{4}$ seconds.

T. ZECKWER suggested the plan of counting as rapidly as the numbers could be pronounced from 1 to 5, which would be found to take about $1\frac{2}{3}$ second. If then $1\frac{2}{3}$ seconds are required for the exposure, by counting thus rapidly 1 to 5, and then 1 to 3, the fraction of the second would be determined with sufficient accuracy for practical purposes.

It being suggested that the time could be prolonged by use of a small stop, Mr. TRUSCOTT made the objection that this was likely to cause diffraction of the rays of light, and consequent fogging of the plate. He stated that the shutter he used was accurately graded for short time work from $\frac{1}{250}$ to $\frac{2}{3}$ of a second.

In reply to a question by Dr. Wallace, Mr. Truscott stated that in wet plate photography with short time exposures, such as portraits of babies, &c., he had frequently heated the developer to about 100° F. before applying to the plate.

For developing short exposures on gelatine plates, he used carbonate of soda 1 part to 4 of water, varying the solution from $\frac{1}{4}$ to full strength. He found different brands of plates to vary greatly in the time necessary for development.

As to the most desirable position for a shutter, he considered back of the lens the best for avoiding fog, and in the middle of the lens the best for economizing space.

Talk in the Studio.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—There will be an excursion to Shepperton on Saturday, July 2nd, the train leaving Waterloo at 2·35 p.m.

NORTH SURREY PHOTOGRAPHIC SOCIETY.—The usual fortnightly meeting was held at the Greyhound Hotel, Dulwich, on June 22nd, Mr. Eskell in the chair. Mr. James was elected, a member. Members brought with them their complete outfits for work in the field, and the more important features of the different kits were explained and discussed. The next meeting will be held on July 6th.

JUBILEE OUTING OF THE PHOTOGRAPHIC CLUB.—From the chronicles of Jubilee events, the amalgamated excursion to Watford, on the 21st, organized by the Photographic Club, must not be omitted. All the principal London Photographic Societies were represented, and a very enjoyable day was passed in Cassiobury Park. Although some excellent photographic work was done, the fresh breeze which kept alive the bunting with which the town was dressed, prevented full justice being done to the sylvan beauties of the park. The party returned at five o'clock to the Essex Arms Hotel, where they showed a thorough appreciation of the excellent repast which had been prepared for them, and the health of the Queen having been proposed in appropriate terms, was drunk with full honours. Several groups of members were taken during the evening.

EXPLOSION AT FALLOWFIELD'S.—Shortly before one o'clock on Monday afternoon, an explosion occurred on the premises of Messrs. Fallowfield and Co., wholesale chemists and druggists, Lower Marsh, Lambeth. A young man named James Causell was corking a half gallon glass bottle containing spirits, and in knocking the cork in the bottle with a small iron weight, the bottle broke, and an explosion occurred. The fire was extinguished by means of buckets of water before the arrival of a manual from Waterloo Road Fire Station.

PHOTOGRAPHIC CLUB.—The subject for discussion on July 6 will be "Actinometers." Saturday outing at Shepperton; train from Waterloo at 2.35.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

E. CLIFTON.—The information you are good enough to send has been made use of.

JOHN DAVIDSON.—Your letter has been handed over to our publishers, as the matter is within their department.

LANDSCAPE OPERATOR.—Your letter will be inserted next week, provided we have permission to give your name.

W. H. H.—1. Probably you allude to the method of Offord, described on p. 174 of the YEAR-BOOK for 1884. The prints are merely squegeed down on French-chalked glass, no collodion being used. When dry, they are stripped off. 2. Thank you for the offer, of which we may be glad to avail ourselves.

L. M.—In the current YEAR-BOOK, pp. 200 and 201.

PETER KNUDSEN.—1. In the case of a symmetrical doublet, it is sufficiently near to take the distance between the ground glass and the stops, when a distant object is in focus. 2. Yes, you may assume it to be $\frac{f}{10}$; a more exact determination of the focal length of the lens can be made by exactly focussing some object, so as to make the image on the screen just the size of the original, and then divide the distance between the object and the image by four.

H. SCHLEUSNER.—Probably about one second.

F. E. F.—1. As a rule there is no gain. 2. We have obtained excellent samples from most of the London dealers. 3. About eight sheets. 4. Half-an-hour in a moderately dry place. 5. Considerable advantage as regards speed in printing and rapidity of toning.

BANBURY.—Probably further particulars will be published before long.

V. W.—Clarified ox-gall—such as is sold for the use of artists—will answer very well; or you may use an ammoniacal solution of bleached shellac.

P. S. G.—As the circular was merely addressed to the imper "Sir," and moreover it reached us without envelope or superscription, no other course was open.

C. PRICE.—Next time use much more bromide; probably three times as much will be about the correct thing.

B. J. PEARSON.—1. We strongly advise you to throw the mixture away, and to make a fresh start; as, even if you should make it work satisfactorily in the end, it will teach you but little: so many additions having been made. 2. It is sold at a shop in Kingsgate Street, Holborn, and the name is either Kittle or something very like it.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1505.—*July* 8, 1887.

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PHOTOGRAPHERS CALLED TO A CONVENTION.

The fact that American photographers meet once a year in a representative convention, called together under the organization of the principal Photographic Association of the United States, has served to give some of the fraternity over here the desire to see something of the sort in Great Britain, and last year some gentlemen called together a Convention in Derby, which was attended by about seventy members. The great mistake upon this occasion was not securing the co-operation and affiliation of the existing photographic societies, as instead of doing this the constructors of the scheme called themselves by the somewhat high sounding title of "The Photographic Convention of the United Kingdom," and invited individuals to subscribe five shillings each, and by that act to become members. The result was, that a meeting was held at Derby in 1886, with a membership of about seventy, and considering the nature of the basis of the organization this result must be considered encouraging.

In making arrangements for the Convention of this year, the promoters of the scheme appear to have recognized their former error in merely trying to gather individual adherents around themselves, and they consequently endeavoured to enlist the co-operation of the established Photographic Societies, and sent to each Society a circular worded as follows :—

> With a view of making the Convention thoroughly representative, I shall be glad if your President, or one of your members nominated for the purpose, will represent your Society at the committee meeting to be held during the week of Convention.

This step, though excellent in a fashion, came a little too late to be altogether successful, as the Societies applied to, evidently felt that a combination of the old and representative bodies should have been taken at an earlier stage ; indeed, that it should have taken place before the Convention had constituted itself, rather than after.

The Convention met at Glasgow on Monday last, in much larger force than in the case of the Derby meeting of last year, our correspondent estimating the number of members at "about 200."

From a circular before us we find that the Council now consists of twenty-four, and although it contains a few well known men, it is not in any way so constituted as to be representative of photography in the United Kingdom ; Ireland, indeed, appears to be totally unrepresented. In addition to this Council of twenty-four, we find there is a Local Committee of no less than seventy-one, but as four members of this are also members of the Council it may be considered to consist of sixty-seven, the total executive thus amounting to ninety-one.

As regards the extent of the membership roll, our enquiries of the Secretary did not elicit anything more definite than "about 200," or, let us put it roughly, about half executive and half ordinary members.

We have great sympathy with the objects of the Convention, and with the really hard and patient work which has been done by the promoters of the organization, but we are of opinion that before the title "*Photographic Convention of the United Kingdom*" is in any sense deserved, a further step will have to be taken in the direction of securing the co-operation of the photographic societies of the United Kingdom. To make the Convention a really representative gathering, the council should be appointed by the fraternity at large, a condition of things which might be realised by arranging for each photographic society in the United Kingdom to contribute one councillor or more, according to its membership roll. A council elected at the meeting of the Convention is a council elected by the few who have leisure and inclination to go holiday-making, combined with a disproportionate local element.

The Convention which met at Glasgow this week must not be confounded with the annual conference and convention organized by the Camera Club, and which held such a notably successful meeting in the theatre of the Society of Arts during February last. At this meeting about three hundred and fifty were present, and the business was managed by a sub-committee of seven.

Our correspondent sends us the following particulars as to the Glasgow meeting :—

An excellent suite of rooms in the Institute of the Fine Arts, 175, Sauchiehall Street, were secured for the joint purposes of exhibition and meeting ; and many of the visitors took up their quarters at Cranston's "Waverly Hotel," which stands just opposite. The Exhibition was opened on Monday afternoon, and was noticeable for the capital hanging of the pictures—overcrowding being avoided. Local work was, naturally, well to the front ; and Messrs. Macnab, G. Mason, Turnbull, T. and R. Annan, T. N. Armstrong, J. Stuart, J. C. Oliver, W. S. Anderson, J. Rennie, W. Goodwin, A. Watson, R. Dalglish, J. Parker, F. M. Gowan, W. G. Fordyce, Alexander Brothers, and others were strongly represented. There was also capital work by Mathewson (Dundee), Dr. Bell, H. Bolden (Derby), W. Glen (Derby), Jas. Paton (Greenock), W. Crook (Edinburgh, including two fine photographs taken direct on Fry's 24 by 20 plates), R Keene (Derby—Platinotype), J. C. Cox (Lochee—twenty capital figure studies), transparencies and prints by the Derwent Dry Plate Co., a splendid series of enlargements by S. Fry and Co., and by Morgan and Kidd, W. M. Martin (Dundee), R. B. M. Stewart, A. Macdonald (Arran), J. G. Tunny (enamels), &c., &c. Many frames, however, had no names upon them.

In apparatus, the two great Glasgow houses of G. Mason and Co., and McGhie and Bolton, made a splendid show, a 24 by 20 camera by G. Mason forming a prominent object. J. F. Shew and Co., the Albion Albumenizing Co., J. Place, and J. Pumphrey (Birmingham), Ross and Co. (case illustrating the "history of a photographic lens"), and many others were well represented. W. J. Harrison exhibited a Scovill Company's camera fitted with Eastman roll-holder and Beck's lens with iris diaphragm, altogether an enviable fit-out.

The Lord Provost of Glasgow (Sir Jas. King) had kindly consented to preside at the Monday evening meeting, but being summoned to London to attend the ceremony of laying the first stone of the Imperial Institute, his place was filled by Bailie Crawford, who welcomed the visitors to Glasgow in a most genial and incisive speech. J. T. Taylor announced that eighteen papers on a variety of subjects had already been sent in to be read at the evening meetings of the Convention; after which a vote of thanks to the Chairman was carried by acclamation. After a short interval, spent in examining the exhibits, Andrew Pringle passed a series of slides (prepared by himself and by Messrs. Armstrong, Wellington, and Reid) through the optical lantern, the meeting, which had been attended by about 120 individuals, breaking up shortly after ten o'clock.

The following papers were read, and will be found in another place:—"The Photographic Uses of Nitrite of Potassium," by H. H. O'Farrell; "Concerning Stereoscopic Pictures," by W. M. Ashman; "Experimenting," by H. J. Gifford; "Intensification," by W. B. Bolton; "Finders and Focussers," by Lyonel Clark, C.E.; "Photography from One Point of View," by Edward Dunmore; and some further particulars as to the meetings will be found on page 431.

◆

PHOTOGRAPHING A BULLET IN FLIGHT, AND ITS ATTENDANT AIR WAVES.

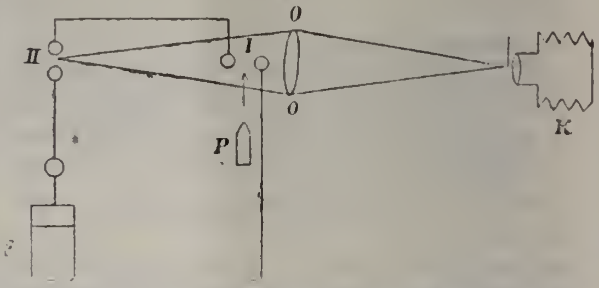
Nothing tends so much to the advancement in public estimation of the art of photography, as some new application of it to the purposes of scientific research. We now have the pleasure of recording such an application, by means of which some of the phenomena attending the passage of a projectile at high speed have been made to register themselves upon a photographic plate, and so to illustrate in a forcible and unequivocal manner the theories which had been formed by artillerists and those concerned in the theoretical department of gunnery, as well as to demonstrate facts of interest in a department of physical research in a way not attainable by any other means.

In a paper recently laid before the Imperial Academy of Sciences of Vienna, the authors, E. Mach and P. Salcher, with whose names must be associated that of Professor A. L. Riegler, of Fiume, describe the method by which they have succeeded in photographing a bullet in flight, and at the same time of reproducing upon the photographic plate the image of the lines of condensation and rarefaction of air which are caused by the rapid motion of the solid body. Extracts from so much of their paper as relates to the purely photographic portions of their labours we lay before our readers, not only on account of the interest which such a triumph of photography must excite, but as showing the way in which the art may be made available in the service of scientific investigation.

The vivid illumination of the bullet, and its surrounding envelope of air is effected by means of the discharge of a Leyden battery, the spark from which is of so short a duration that the bullet, notwithstanding its high speed, has not time to move far enough to destroy the sharpness of its image, and the arrangement for the purpose is as follows: The circuit of a Leyden battery F (fig. 1) is broken at two places, I and II. At I the electrodes consist of wires enclosed in very fine glass tubes. The projectile P breaks these tubes in its flight, and sets free the current which passes at I and II. The partially hidden spark at II illuminates the projectile in front of the objective O, which last throws an image of the spark II upon the ojective of the photographic camera K. The image of the projectile with the electrodes, the spark as I, and the changes in the density of the air is thus thrown upon the plate at the exact moment when the darkened chamber in which the experiment is conducted is lighted up by the current set free by the projectile itself.

The apparatus comprises the photographic objective by Voightlander, O, of 10·5 cm. aperture, and 38·2 cm. focus, and the photographic camera K fitted with a Steinheil objective. The distance from II to O was 48 cm., and from O to K 230 cm. The distance of the muzzle of the barrel from the electrodes was varied in different experiments from two to four metres. The strength of the battery was also varied, but finally a jar was settled upon whose capacity was of 410 square cm., which was charged to give a spark of from six to seven mm. Too great capacity involved too long duration of the spark, so that, with a high velocity of the projectile, the picture was not sharp.

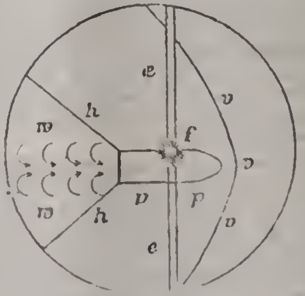
Fig. 1.



The experiments were carried out with projectiles having initial velocities of from 327 to 530 metres per second, and in the results it was found that an optically recognizable condensation of air in front of the projectile only occurred when the speed of the bullet exceeded that of the transmission of a sound wave—*i.e.*, 340 metres per second. Experiments made with a carbine shot, having no greater velocity than from 327 to 339 metres per second, showed no effect of compression. This, indeed, had been previously found in some former experiments of Mach and Wentzel. On the other hand, when using infantry barrel of Werndl and Guedes' construction, producing velocities of from 438 to 530 metres, very sharp and beautiful results were obtained.

When a sufficient velocity of the projectile is obtained, the compressed air in front of the bullet takes the form of a hyperboloid curve, the vertex of which is in front of the projectile, and the axis of which is the line of the fire. In a similar manner a symmetrical figure is formed in the air to the rear of the projectile, but in this case the lines marking the margin of the figure are straight, and form the sides of a cone truncated at the base of the projectile. With the highest velocity, a third phenomenon appears in the shape of characteristic clouds filling the space behind the projectile. These are indicated by the curved arrows in fig. 2. The ærial displacements are closely analogous to what may be observed in the case of a ship cleaving the water. The borders of the waves thrown up at the stem and stern of the vessel, and the whirl immediately behind

Fig 8.



p p, projectile; *e e*, electrodes; *f*, spark, shown at I in fig. 1; *v v*, border of the air wave in front; *h h*, border of the hinder air wave; *w w*, whirls of air in the rear of the bullet.

the keel, are counterparts of the ærial currents that have now been demonstrated by photography. These currents and whirls in water can be studied on a small scale by using a model drawn through water in which a little gold-bronze has been stirred up.

The use of the Leyden discharge as the source of illumination for photographic work was known and appreciated even in the Daguerreotype days, and we are glad to see it applied in the practical manner which has been described. Electrical discharges of the Leyden or condensor character, whether generated by the induction coil or by machines of the Voss or even of the older types, may be made to serve the photographic purposes for which the arc light is now used; similar precautions, when desirable, being taken to diffuse or shield the direct light, and work by that reflected from extended surfaces.

This method of working should be particularly useful when it desired to photograph subjects in motion, and in place of opening the lens by the movement of the object, as was done by Muybridge and others, this movement would be made use of to join the circuit, and set free the discharge.

The work of Mach and Salcher is illustrated not only by woodcuts, two of which we reproduce, but by a series of collotypes, enlarged, some of them, three diameters from the original small negatives. These pictures show the bullet as if stationary, and reproduce the air waves and whirl in a very remarkable manner.

NOTES ON PHOTOGRAPHY AT SAN FRANCISCO.

BY W. K. BURTON.

The thing amongst things photographic that I have seen here that has interested me perhaps more than others, is a series of large Daguerreotypes of very good quality, showing the Bay in 1851. These Daguerreotypes hang in the rooms of the Amateur Photographic Association of San Francisco, and are interesting because they illustrate a bit of history. In this year (1851) the "gold fever" was at its height. In all parts of the world, people in all positions of life were casting aside their employments, leaving their homes, their friends, and all ties, and were rushing, like beings possessed, to the newly-discovered gold fields. Ships arrived at San Francisco from all quarters of the globe, and, immediately they set anchor in the Bay, men deserted. Not a sailor or hand on them but what caught the fatal fever, and sped inland to the diggings. A man could not be hired for twenty dollars a day, and the ships had to be left to rot where they first dropped anchor. The Daguerreotypes referred to showed the hulks lying on the waters in various stages of disintegration. On the hulk of one ship is painted up in large letters, "Store," the owner, or his representatives, having evidently become resigned to the idea of letting her rest where she was.

It appears that the part of the bay where the greatest crowd of ships show in the old photograph has since been reclaimed—has been filled in, that is, and has been built over. Recently, some rebuilding was going on, and the excavations came right on to one of the old hulks. They were never removed, but the earth was filled in around them: they were literally buried.

Rough times those of the gold fever must have been. I imagine that but a small percentage of those who made so wildly for the diggings ever came back again.

Talking of rough times reminds me that I have seen, since I have been in America, two photographs of "lynchings," or rather of the hanging bodies of the victims after the lynchings were over. Repulsive enough looking pictures they are. In one case the body is seen hanging from a set of shear-legs, apparently erected for the purpose of the execution; in the other it hangs from the cross-bar of a telegraph pole. In each case there is a crowd of men underneath who have an expression of cheerful satisfaction—on account of their own superior virtue, doubtless.

It was my impression that this sort of thing had died out, even in the extreme West; but it appears it has by no means done so. I took up a local newspaper a few days ago, and saw in it that an attempt was being made to seize two negroes out of one of the state prisons to lynch them, and that if the attempt were continued "bloodshed would certainly ensue." The object of the lynchings is not very evident, for it appears always to be some criminal who would be hanged legally in any case who is selected. The excuse is that it is done to prevent a miscarriage of justice; but it seems to me that more of the brutal element, which is always ready to rise if it be not kept under, is in the thing than anything else.

In the gallery of Taber, an eminent photographer here, I saw a series of photographs taken from a balloon, which struck me as the best thing of the kind that I had seen. I send prints of them, in hopes that they may be considered good enough—some or all of them—to be reproduced. The following is a brief account of the trip given to me by E. H. Husher, who made the ascent and the exposures.

The ascent was made on the 15th April at 10.50 a.m., being organised by the *Daily Examiner* newspaper. In the balloon were a representative of that newspaper, a professional aeronaut, Professor Van Tassell, and the photographer already mentioned. The greatest elevation reached was 2,000 feet, and there appears to have been some difficulty experienced in preventing the balloon from drifting out to sea.

The camera used was 10 by 8 size, and it was fixed on a swivel arrangement, over the edge of the car, which enabled it to be directed at any angle with the perpendicular. Twelve plates of American make were taken, a No. 3. euroscope lens was used—precise focus not known to me, but long for a 10 by 8 plate—and the exposures were made by the aid of a rapid double action shutter.

From the twelve plates, six good negatives resulted. Husher noted what has, I believe, been observed by all who have made attempt at balloon photography, that there is great difficulty in getting contrast in the negative. This is due probably to lack of any deep shadows (the *under* sides of all objects being of course hid from view, and every point seen being illuminated at least by the whole sky), and also to somewhat of land mist.

On the fact of the difficulty in getting contrast the *Examiner* representative, in his account of the trip, enunciates some truly wonderful theories as to colours and paintings, heading his remarks, "Important Discovery– The Application of the Theory, and Proof of the Theory." Husher, however, noted that, although very deep shadows nowhere existed, the contrast of *colour* appeared particularly vivid, and he anticipates that, by the use of orthochromatic plates, which register a greater range of colour than ordinary, he will be able, when he makes his second attempt, which will be soon, to get results still better than he has. This appears likely, the whole of a balloon view corresponding somewhat to the *distance* in a landscape, which distance, as is evident from the result of recent experiments, is better rendered by orthochromatic than by ordinary plates.

Some difficulty was experienced in landing, Husher contriving to get out of the balloon on the top of a tree with his plates unbroken, with the natural result that the balloon, with its two other occupants, bounded into the air again, and only landed for the second time at a considerable distance.

THE LATENT OR DEVELOPABLE IMAGE.

BY CHAPMAN JONES.

The researches of Carey Lea that have recently been published have yielded results of great value, but as soon as the investigator has left the safe realm of experiment for the doubtful ground of inference, he makes statements which do not carry conviction with them. I refer particularly to those paragraphs that deal with the latent or developable image, and I think that it will be not difficult to show that the experiments which are supposed to support a certain theory are strong arguments against that theory.

It is a thankless task, the endeavouring to put out what was hoped to be a little light on a very dark problem; but a false light is worse than no light at all, for it not only leads astray, but hides the feeble gleam of truth.

There appears to be no *prima facie* reason to doubt the accuracy of the experimental results that Carey Lea has set forth, and for our present purpose, therefore, we will assume that these are unimpeachable.

He finds that when the chloride, bromide, and iodide of silver are exposed to light they lose a small but not definite amount of the halogen, and that the chemical properties of the products are different from those of a mixture of the sub-salt with the unchanged salt, and also different from a mixture of the unchanged salt with metallic silver. He therefore suggests that although a sub-salt of fixed composition is formed (this much in deference to the accepted notions of chemical compounds), this sub-salt combines in an indefinite porportion with the unaltered salt (this to reconcile his theory with his experiments). These indefinite and ever-varying compounds he names photo-salts, and it is convenient to use this name to avoid circumlocution.

The photo-salts he also produces, without the aid of light, by means of a large assortment of chemical reducing agents, and also by the action of oxidizing agents upon metallic silver. But what we need especially to remark is that these photo-salts are produced by the action of light, and that they have a remarkably great tinctorial power. He says distinctly that "as little as half of one per cent. of sub-salt combined" gives a "strong colouration," and that a quantity "inappreciable to analysis is capable of affecting the colour." A preparation containing two and a-half per cent. of sub-salt is described as of a purple black colour.

Carey Lea then continues by describing the exceedingly interesting discovery that sodium hypophosphite can be caused to bring about a condition of affairs in the haloid silver salts that is so exactly similar to that condition caused by light when it gives the latent (I prefer to say developable) image, that he fails to find a difference between the two effects, except in a perhaps unimportant point, which we will pass over.

He then argues that the developable image consists of photo-salts, and it is this idea that I wish to suggest is so far from being proved, that he who interprets these results as showing that the developable image does *not* consist of photo-salts takes up a position from which he cannot be driven.

The first, simplest, and most obvious test for these photo-salts is their appearance, for an amount which Carey Lea, as a practised investigator, cannot detect analytically is conspicuous by its colour. The colour is, therefore, a more delicate test than the balance, yet the developable image, which consists of these photo-salts, is absolutely invisible. This discrepancy he excuses by saying that "it would seem that the particles affected, although numerous enough to serve as a basis of development, are still too few and too scattered to be visible or affect the colour." It is clear to the feeblest scientific intellect that though this may be so, the statement simply begs the question. Thus the only method that has so far been made known of testing for photo-salts, when applied in this case, argues that the developable image is not composed of photo-salts.

Carey Lea seems to consider that the production of a developable capacity by means of sodium hypophosphite is an argument in favour of the presence of photo-salts in the developable image. It is difficult to see that this affects the question in any way whatever. The hypophosphite is a reducing agent, and so is light; but if fifty reducing agents would individually bring about the developable condition in haloid salts of silver, that would be no proof or argument that the developable condition was due to reduction when the most delicate methods of detecting that reduction failed to show it. To state otherwise is again simply to beg the question.

But this matter does not rest merely upon these negations. There are positive reasons why we should consider that the developable image does not in any sense consist of these photo-salts. The photo-salts are products of reduction; they contain less of the halogen than the unchanged salt. The production of the photo-salts depends, therefore, upon the removal of halogen from the silver compound. Development is also a process of reduction; and if the action of light, in forming a developable image, is to form these photo-salts, we should be justified in expecting exposure and development to be equivalent—interchangeable, at least, up to the production of a visible image by light. It must be particularly borne in mind that a visible image would be produced by so minute a quantity of photo-salt that chemical analysis could not detect it. Now an ordinary gelatine plate becomes undevelopable by the action of an amount of light that would have to be multiplied probably by many hundreds if not thousands of times, before the very minute amount of photo-salt is produced that is necessary to make itself visible.

The reversing action of light is, I consider, the sheet anchor of the investigator of the nature of the developable image. But in supposing that the developable image consists of photo-salts, we have not only no explanation, but no theory of this phenomenon. When the feeble light that can find its way through the aperture of a landscape lens acts upon a sensitive plate for a second or so, a developable image is produced. If the light is allowed to act for a few minutes, the dark parts of the subject may be developable, but the lighter parts have by the further action of light lost their capability of development. A further increase of exposure under certain circumstances again confers the possibility of development, but this alternating action of light soon dies out. A very considerable further increase in the amount of light or duration of its action begins to produce a photo-salt, as evidenced by its colour. To ask one to imagine that the effect of light from first to last is of the same sort, and that it simply increases the amount of the products of its action, is to expect an amount of credulity that is not compatible with a scientific mind.

ON THE PROPER TIME FOR EXPOSURE OF DRY PLATES.

BY LIEUTENANT C. L. BRUNS, U. S. N.*

Can a close approximation of the time of proper exposures be determined scientifically?

The object of this paper is to give briefly a history of some personal experience in this direction.

I would premise that the practice of photography is based entirely on variables, which is particularly unfortunate with the amateur, whose work is only occasional and with subjects constantly changing. He therefore learns nothing definitely by his previous work; his experience is of but little service to him, as he is constantly confronted with variables.

To reduce the variables has prompted me to experiment upon the actinic effect of light. I have tried several plans, and finally adopted a very crude sensitometer, which, however, has served me very well.

The sensitometer referred to is albumen paper freshly prepared for each day's work. This involves but little trouble or time; a strip cut from a sheet of albumen paper, say one inch by six, put in a jar containing the sensitizing solution (nitrate of silver of some fixed strength) for an indefinite time, is drained and dried, and not to be fumed. Place the sensitized slip of paper between two flat pieces of wood bound together with rubber bands; pull the paper out to protrude, say, one-half inch. Expose this to the sun until it has blackened all it will, and call it actinized. Now pull out one-half inch more, expose it to the sun and note the time. I find it convenient to stand back to the sun, or facing north, and place the paper on the ground at a distance of four feet from the point where I stand, and maintain this as a constant, and then wait until the newly-exposed paper reaches the colour of the first, or is actinized, noting this time, which interval I will say is one minute. Suppose, now, I desire to take a copy of a picture in my room. I have here an ordinary plate holder so arranged that any portion of the sensitive plate may be shielded, while the rest may be exposed. In the dark room I shield all but the lower fourth part of the plate, I then expose it in the camera, say ten seconds, and take the plate to dark room, raise the shield, exposing this time two-fourths or one-half of the plate. Returning to the camera I expose ten seconds, thus giving twenty seconds to the first fourth, ten seconds to the second fourth, proceed the same with the third fourth, exposing ten seconds, then the fourth fourth, or the whole plate, exposing a few minutes with cap on, or it need not be exposed in camera at all. In the former, on developing, if the camera leaks it will show on the fourth fourth; in the latter, then the dark-room lets in actinic light. Now the first fourth being exposed three times, each of 10 seconds, or 30 seconds; second fourth 20 seconds; the third fourth 10 seconds, the plate being developed will show which section was most favourably exposed. Assume this section to be the second fourth, or 20 seconds. We now arrive at the conclusion that when a piece of sensitive paper takes one minute to actinize, then say (Mr. R.'s) plate, registering sensitometer 16, requires 20 seconds for a proper exposure. On some subsequent occasion I desire to make a copy of a similar subject. Expose a paper the time to actinize is two minutes. I know that with (R.'s) plate, registering sensitometer 16, when the paper actinizes in one minute it should be exposed 20 seconds, and from the following proportion the proper exposure of the plate of subsequent day is determined, viz.: 1 minute to actinize is to 2 minutes to actinize, as 20 seconds (the trial exposure) is to the proper expose, or 40 seconds, which is the time to properly expose on the subsequent day. Therefore all that is necessary on the subsequent day is to focus and expose 40 seconds, and we have a properly exposed plate.

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* Read before the Society of Amateur Photographers of New York.

For outside work, using slow plates, follow the same procedure, but expose three plates. For economy use small plates. Make exposures of sensitive paper before and after the plates were exposed, to be certain the conditions did not change. Obtain the time to actinize the paper, and the time of the best of these plates. This gives a positive condition for that plate and that character of subject. On a future occasion, by exposing a sensitive paper, the actinic condition of the light and the time of exposure is obtained by the law of direct proportion—that is, the time of exposure of sensitive paper to a certain actinic effect on the trial plate is to the time of a subsequent exposure of paper to an actinic effect, as the time of proper exposure given by the trial plate is to four, or the proper time to expose the plate on a subsequent occasion, the character of subject being considered similar. The character of subject may be determined to suit the individual taste; for instance, a marine view, clouds, foliage, bright sunlighted scene, or scene entirely in shade. If trial exposures are made for each, and carefully noted, there should be no difficulty, by reference, to obtain the time of correct exposures.

For rapid work I place great reliance on the proper selection of the shutter-spring. Its action should be uniform. It does not matter so much how fast it is, but that its tension should be constant. Fix the spring permanently. A rubber band is bad; it is deceptive, and subject to wide changes and irregularities. Graduate the time by the diaphragm, and not by varying the tension of the spring. In the trial exposures use, say, $\frac{1}{8}$, $\frac{1}{4}$, $\frac{1}{2}$-inch stops. The areas of these are to each other as the squares of their respective diameters, and are respectively $\frac{1}{64}$, $\frac{1}{16}$, and $\frac{1}{4}$ of an inch. The amount of light that passes through stops is directly proportional to their areas, hence the $\frac{1}{8}$-inch stop is four times faster than the $\frac{1}{4}$-inch, and sixteen times faster than the $\frac{1}{2}$-inch stop.

Now proceed with the trial plates.

Interiors.—Expose the sensitive paper in the room on the wall directly in front of the lens. Make a trial exposure as explained under copying. Let the exposures be, say, half-an-hour apart, or what the experimenter may conclude as best. Note the time it takes the sensitive paper to actinize, and the time of the exposure as given by the trial plate, and then, by the rule suggested, you can obtain the time for proper exposures in any other interior.

In conclusion, I would recommend you to make a copy on the shielded system as applied in this plate-holder, and you will be more than pleased to note the effect of the developer and the results. You will also see how much longer the zone of proper exposure is than you believed. You can tell what the actinic difference is, whether your windows are open or shut in the studio, and the range of time of any particular plate by which a proper picture may be secured.

REMARKS ON LIEUTENANT BRUNN'S PAPER.

BY D. H. WALKER.*

To reach the maximum exposure any plate will stand has been one of the difficulties in the way of all photographers. When you have put your plate in the holder, the first question presenting itself is: "What stop shall I use?" Next: "How long an exposure shall I give this plate?"

If you are in doubt, you ask your learned and experienced friend near by, and he puts his finger alongside his nose, looks wise, examines the sky as if he were in search of a comet, and then coolly suggests; "Well, I guess (and it is all guess) I'd give her, say, ten seconds." Now your own idea had been two minutes' exposure. If you ask four different persons, all of equal skill, they will "guess," at a variance of from 50 to 100 per cent. Now, how ridiculous this appears to be, and is. Here is a science based upon exact chemical laws, and yet we are constantly guessing. How to overcome that part of the guessing which relates to the exposure of a given plate has been the subject of inquiry and experiment by Lieutenant Bruns and myself, with the object of presenting the results for your information and discussion.

Experiments made yesterday by us demonstrated that to actinize sensitized paper required 107 seconds. A Carbutt B plate (16 sensitometer), exposed in parts for two, four, and six seconds, on development, gave best results and clear detail on that portion which was exposed for four seconds. Thus we had the two constants or non-variables for that kind of plate, they being 107 for the paper and 4 for the plates. Now these results are to be utilized as the basis of all calculations for exposure of such plates, and the process of arriving at the correct time for exposure on some other day, when the light may be different, will be as follows:—Say next week on a dull day I wish to make a correct exposure of a similar plate. To do this, I first expose a piece of the sensitized paper as explained. Say it takes five minutes to thoroughly actinize it, which is equal to 300 seconds. Now I have learned that this day it required 300 seconds to do what on another day requires only 107 seconds. I therefore make the figures to ascertain the required exposures to be given—to wit, as 107 is to 4 (these being the constants), so is 300 to the required exposure, and the answer is thirteen seconds; so that yesterday I would give four seconds' exposure, and next day, as per example, thirteen seconds.

With such experience as we have had, we feel satisfied this method is approximately correct. And I am certain, as experiment has proved, that the larger the constants the greater is the margin for correct exposure of the plate when taking a picture. That is, if the constants are ten times greater than those given, say 1,070 seconds and 40 seconds, the chances of correct exposure are increased in that ratio. An experiment made to-day with a new lens and camera showed that it only required 90 seconds to actinize the sensitized paper, and that a Carbutt B plate exposed seven seconds with the smallest stop (being only $\frac{3}{32}$ of an inch in diameter) gave the best negative. The two figures being used as new constants, a further experiment was made by exposing the sensitized paper in the shadow of our working room. After exposure of 18 minutes and 42 seconds, the paper showed partial actinization. As time was pressing (at four o'clock p.m.), a piece of paper was taken into the sunlight and was allowed to actinize up to an apparent similar extent, which required 20 seconds. At the same time a fresh piece of paper required two minutes in sunlight to become fully actinized. It will therefore be noted that the piece of paper exposed in the room, which had been partially actinized, if taken into the sunlight would have reached actinization in two minutes, or 120 seconds. And as it required two minutes to fully actinize, it had been exposed to within $16\frac{2}{3}$ per cent. of complete actinization.

Multiplying this partial actinization of the paper (say 16.67) by 6, we show that it would require about 112 minutes, or 6,732 seconds, to actinize in the shadow of the room. Again using these figures, we show that as 90 seconds required to actinize in full sunlight is to 6,732 seconds, so is the time of proper exposure determined this morning, say 7 seconds, to the time of proper exposure this afternoon in the shadow, which is 8 minutes and 44 seconds.

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* Read before the Society of Amateur Photographers of New York.

To summarize these figures, we may say that the simple sensitizer adopted, that is, the silvered paper, will give a very near proximate of the proper time for exposure of any given plate when taken in connection with the standard time of actinization, which we call a constant, and the exposure of the plate mentioned, as in the shadow of the room, was done without any other than this simple means. There need not be any doubt as to the use of the stops; one single stop will do for all exposures, when once this constant is obtained with any one of the series. So far as we are able to judge at this time, we prefer using the pin-hole stop, which has given the results mentioned above. If any man ask, "Well, what of all this?" we can answer that it is an approximate method of arriving at the proper time for exposure of a given make of plates, and that too without any "guessing."

In presenting this for your consideration, we are not unaware that others have experimented in the same direction, nor that the emulsions on plate and sensitized paper are chemically different; but we are anxious to broach the whole subject for your consideration, hoping it may lead to investigation and some useful result.

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FINDERS AND FOCUSSERS.

BY LYONEL CLARK, C.E.*

Could one have known Daguerre's thoughts whilst he was sitting with whitewashed face before his camera, patiently waiting for the sluggish plate to delineate his features, we should doubtless have found that he was building aerial castles where exposure was reduced to a minimum, and, indeed, we know how hard he and his successor, Dr. Victor, worked in the direction of improving the rapidity of their sensitive plates. In fact, ever since the discovery of photography, experimenters have been striving to improve in this direction, and there are few commercial brands of plates now made but that are too rapid on open subjects for hand exposure, and some form of shutter is a *sine quâ non* with all photographers. But, remembering the old adage, although it is an easy thing to get shutters and plates for the most instantaneous kind of work, it is not quite so easy to catch your object. By the time you have focussed and got your back in, slide removed, and shutter set, your subject may be a long way off. In the case of a passing express, the 4·5 problem of Euclid for the tyro amateur, it is easy enough, you can do all that beforehand, and await the arrival of the fiery Pegasus; but all animate or moving objects do not run on rails, but have to be followed and taken at any moment. Even at the Zoo, where the denizens are decidedly limited as to recreation ground, it is a constant enough fact to find, after the plate is developed, that the animal is not in focus, or else his head or tail are wanting. In the case of ships or yachts, how often do we see a good picture spoilt owing to the want of a few feet more bowsprit or the peak of the topsail. Of course, with any of the ordinary finders, this should not happen, and as yachts are virtually all taken at about the same distance, the focus does not come in as a factor, for a fixed focus and a small stop bring everything sharp. But in the case of animals, where, perhaps, a portrait lens with small depth of focus must be used, and where the subject is well within the focal variation of the lens, this plan does not work.

Some cameras are marked for foci of varying distances, but this is open to many objections. You have first to train yourself to properly judge the distance, and then you have to rapidly change the eye from the finder to the marks and back again, and it is more by good luck than by skill that you get a successful picture. Men like Mr. Dixon, who make a speciality of animals, have boldly gone in for double cameras and double lenses, and this plan is, without doubt, the most effective; but it is expensive and extremely cumbersome, and quite prohibits its general use, for no one could make a point of carrying about two cameras because he might get some instantaneous work. Some time back I tried using a telescope, and marked off the focal lengths to correspond with similar marks on the baseboard of my camera, but soon dropped it, as I found it very inconvenient, and required two persons to use it properly. Later on, I utilised, for the same purpose, that scientific toy called the walking-stick telescope. This, as many of you doubtless know, consists of an objective which is clipped on to the walking-stick and can be slid up and down on it, and a plano-concave eye-piece, also fastened on to the stick, thus forming a Galilean or opera-glass style of telescope, and is really of more or less practical use. I screwed an objective of the same focal length as my lens on to the front of my camera, on the back or sliding portion I fixed an ordinary focussing glass with a piece of ground glass cemented on; subsequently I discarded the ground glass, and substituted a small wire to focus on. This apparatus was adjusted to the camera, and, of course, the the two objectives being of the same focal length, when the top one was in focus, the bottom one—that is, the camera proper—was also in focus, and this held good for every position of the object. There was, I believe, nothing new in this. Mr. Traill Taylor described such a focusser at the Conference last year, and Mr. McKellen also made a similar one; and, moreover, I believe it has been described at a much earlier date. The drawback I found was that it only gave you a very small portion of the subject, and you were obliged to have a finder at the same time; and the changing from one to the other I found by no means easy to manage.

Last summer I was rigging up a camera specially to take some puppies and kittens, and had intended rigging up a second camera on top of the first. On working out the designs, I at once saw that by far the simplest and easiest method was to utilise the ground-glass of the camera proper, since it could not be required at the time of exposure. I simply turned up the screen then till it stood vertically above the top of the camera, and in a plane of course parallel to the plane of its usual position. On the front of the camera I raised up an extra front above the existing one, and fitted into it a lens of the same focal length as my objective; this lens was in a sliding tube. I now had the framework of a second camera on top of my first one, and throwing a focussing cloth over the whole, I got an image on my upturned focussing screen. To adjust this, I first focussed very accurately the bottom camera, the screen for this purpose being of course turned down on some object. I then, without shifting the camera, turned the screen up, and clamped it there with some brass pieces, and then slid the tube of the upper lens in and out till I got the same object sharply focussed on the screen in its upper position. Now the two cameras, or rather camera and finder, coincide, and of course as I rack out the one the other follows; and the foci of the two lenses being equal, whenever an object is sharp on the turned up screen I know that it is also sharp on the plate with double back below. There is no need to be particular as to the lens used for the finder—even a spectacle lens will do; but this is objectionable where your lens proper is of a longish focal length, as the spectacle glass is totally uncorrected for spherical aberration, and gives a more or less sharp image over a great depth of focus; a single landscape lens, but with the stops removed to give as much light as possible, is undoubtedly the best, except you go to the expense of having twin lenses.

Although the focussing-cloth does extremely well as a make-shift, yet in the case of wind something more is required. I have a sort of cardboard body, that folds like one of Ottewill's old collapsing cameras. This is made in the form of a truncated pyramid, it slips with an elastic band over the tube of the finder lens, and so gives the play required; the other end comes over the focussing screen, and projects like a box a little way beyond it, and gives the necessary shade to it, so as to allow the image to be seen. Many other ways of covering in the finder will doubtless present themselves to you—a body like a Chinese lantern would do, or even an old bellows, though somewhat more bulky; for you must remember that it is not at all necessary to keep out all light, indeed it is surprising how much you can see with nothing between the eye and the ground-glass.

As to the manner of retaining the screen in its upright position, or of fixing on a false front, it is impossible to give any strict directions, cameras differ so in construction; but it requires but a small amount of ingenuity to devise some method. I may add that I have for my small camera, a focussing eye-piece which is kept pressed up against the ground glass, being held in position by a spring; this leaves me both hands free to hold the camera and focus, &c., and at the same time permits of my getting, if necessary, a most absolute focus. I have found this little arrangement of focusser and finder, which I described and showed at a meeting of the Camera Club last October, of the very greatest use and benefit. I always carry it about with me, for it at least has the merit of neither adding anything to the bulk or weight of your kit, although at the same time you have all the advantages of a double camera.

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* A communication to the Photographic Convention.

INTENSIFICATION.

BY W. B. BOLTON.*

I heard an amateur remark, a short time ago, "I never intensify," and I felt inclined to retort, "Perhaps it would be better if you did"; but as I thought he might recognise the truth of the reply, and I did not wish to hurt his feelings, I refrained. It is all very well and very pleasant, no doubt, to be able to dispense with the operation of intensification, but who that values his reputation for uniformly good work will undertake to do without it altogether? It is absolutely necessary at times, even under the best of arrangements and the most careful working, and he who says, "I never intensify," is either a *perfect* manipulator—which I don't believe—or a careless one who takes little true pride in his work, which is more likely.

But intensification has got into sad repute in connection with gelatine plates, owing to the liability of the intensified image to change, fade, or become denser with time and exposure to light. This applies equally to all forms of intensification, though mercury, in some of its forms, has secured the worst reputation; still, I have little hesitation in expressing the opinion that the instability is not due to the method of intensification, but to the want of care in preparing the film to receive it. I have negatives which were intensified seven or eight years ago by one of the most distrusted of mercurial methods that are as good to-day as when newly done. I have on others every form of defect that can come from mercurial change.

Silver intensification, on the other hand, though the practically universal method employed with collodion plates has gained little favour with gelatino-bromide workers, on account of the liability to stains and discolouration of the film during the operation itself: while it has even been alleged that a gelatine film which has been touched by a solution containing a soluble silver salt is doomed to discolouration sooner or later. With regard to the liability to stains, I have frequently endeavoured to show that it is far easier to prepare the gelatine film for silver than for mercurial intensification, but the difference is that a degree of carelessness that suffices in the case of silver to produce immediate change will be more tardy, though no less sure in its effect, when mercury is employed. The change produced in the one case is, in fact, instant and complete; in the other, deferred, gradual, and incapable of check. With silver, and only moderate care, the change or stain may be but slight; with mercury, under similar circumstances, the utter ruin of the negative is only a matter of time.

As concerning the alleged after-deterioration of silver-intensified negatives, I can only say that I have some that were treated in that manner in the summer of 1880, and which, up to the present time, have exhibited not the faintest sign of any sort of change; and I will say further, in connection with them, that if there be any virtue in the oft-vaunted "wet-plate chararacter," they possess it in far greater degree than others treated in a different manner, or not intensified at all.

Silver intensification is, and always has been, my favourite, where permanency of result is required (if a negative be only required for temporary purposes, it is not worth the trouble), and recently I have modified my method of using it. Previously I have adhered to the formula frequently given in the *Journal* and *Almanac*, in which plain solutions of pyro, and of silver acidified with citric and nitric acids, are used; but latterly I prefer to employ a solution of pyro, critic acid, and glycerine, with a separate solution of silver acidified only with nitric acid. The advantages of this method are, that the solutions will keep indefinitely, or practically so, and that the glycerine causes the solution to flow readily over the film, enabling the operator to use a very small quantity by pouring on and off the plate, and thus economise silver, as well as saving the trouble of freeing the back of the negative from the dense deposit of silver that occurs when a dish is used.

I make the following stock solutions :—

A—	Pyrogallic acid	10 grains
	Citric acid	2 "
	Glycerine	1 ounce
	Water	1 "
B—	Nitrate of silver	60 grains
	Nitric acid	30 minims
	Water	1 ounce

For use, dilute one part of A with two parts of water, and pour on to the plate, leading it to the edges with the finger or a camel-hair brush, if it refuse to flow alone. One drachm of pyro solution mixed with two drachms of water suffices for a half-plate. When the solution runs smoothly over the whole surface, return it to the developing glass, into which half-a-dozen drops of B have been placed, and again apply the mixture to the film, keeping it in motion all the time. The density comes rather slowly, and it should be borne in mind that it increases greatly on drying the negative, so that allowance must be made for that.

The only preliminary preparation the negative requires after fixing is a thorough washing, but this may be supplemented by a minute or two's soaking in alum and hydrochloric acid as a final precaution. Removal of the hypo by means of eliminators, instead of by washing, is worse than useless; besides which, other substances, as the hypochlorites, hydroxyl, or even alum when long applied, destroy the power of intensification. The negative is, therefore, better if simply washed. Should a slight yellow stain appear after prolonged treatment, it is easily removed after the operation is complete by a short re-immersion in the alum and hydrochloric acid, provided it is only silver stain, and not hypo. The final dip in alum and hydrochloric should always be given in order to destroy any free silver that may remain.

Intensification is more rapid before fixing than after; but unfortunately, with gelatine plates, it is most difficult to judge accurately of the density. It may often happen, however, that when a very thin image has to be treated, the application of the intensifier before fixing will prove advantageous.

EXPERIMENTING.

BY H. J. GIFFORD.*

In looking over the papers of the present day, what strikes me is the vast number of photographers we have experimenting, and how few of them know really how to experiment. They give some of their results, but not all; and even those results are not of any use, owing to some point having been forgotten.

I think it might be useful to some if I pointed out some things which ought to be noted. First, the note-book with the notes of the experiments ought to be kept in such a way that if it was handed to any one else he could perform the experiments over again, and get the same results.

The chemicals used ought to be of the purest obtainable; the maker's name and date of obtaining noted, and if possible tested for impurities, as the results obtained may be due to re-actions of the impurities instead of the salt. The distilled water also ought to be carefully tested for iron, &c., which it often contains, the first and last portion passing the still being discarded.

Thermometers ought to be in use constantly, and where gases come into consideration, the reading of the barometer also. In boiling solutions the process ought to be described in this way :—Temp. 62°, in twelve minutes, 212°; boiled half hour, bulk reduced 120 C.c.; cooled to 62° in one and a half hours; barometer at beginning of operation, 30·213; at end, 30·209.

Notes.

The versatile genius of Francis Galton has brought him before the public in so many ways, and in connection with such important scientific investigations, that his suggestion on page 429, with regard to the making of silhouettes by photography, may at first sight appear somewhat trivial by comparison.

Not only is a silhouette very often an excellent and characteristic likeness, but silhouettes of children and others can very often be utilized with advantage by the decorative artist, and we strongly recommend the suggestion of Galton to the consideration of the photographic craft.

A French Court of Arbitration has had a "nice point" to decide, arising out of the growing fashion of having whole theatrical scenes, together with the actors and actresses, photographed. One of the scenes in "Comptesse Sarah," played in a Parisian theatre, was lately photographed, and among the characters was M. Romain in his *rôle* of Pierre Séverac. The photographer, M. Chalot, omitted to send M. Romain a proof, and the consequence was, when the actor saw the published print he expressed his dissatisfaction, and applied for an order to suppress all the photographs in which his portrait appeared. The Arbitrator pointed out that a certain amount of publicity naturally attached to the dramatic profession, and how far the reputation of M. Romain was damaged, it was not for him to say. It was, however, clear that M. Romain had no control over these photographs, in which other persons, who had made no complaint, were represented. He therefore decided against the actor. There seems to be common sense in this decision, but it suggests the speculation, what would have been the result supposing somebody besides M. Romain had complained. In this case, we presume, the majority would have carried it. Thus, if there are eleven persons, and four only grumble, the four must bow to the decision of the seven. If some rule like this be not adopted, the photographer will have no peace, for we never knew the photograph of a group which satisfied everybody.

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* A communication to the Photographic Convention.

The dismal forebodings as to the havoc which zincophotography and photo-gravure were going to play with wood and copperplate engraving have not yet been fulfilled. The *Times*, in noticing a recently-published engraving, says: "It is plain that the competition of photo-gravure has not as yet done harm to our school of engravers." In the course of a conversation with the head of one of the best known firms of wood engravers in London, he said he could find no falling off in the demand for wood-cuts. In this case, however, the firm had been wise enough to move with the times, and had added photo-zincography to their business. The competition of photography with the cheaper forms of wood engraving has probably been felt, but the first-class engraver still holds his own. Because photo-zincographs are so frequently seen, it is not to be supposed that it has driven wood engraving out of the field. What is really the fact is, that where one paper used to have illustrations, a dozen are now to be found.

Manufacturers of photographic materials—such as dry plates, carbon tissue, and development papers—are at present much at the mercy of the dealer, who may keep the articles until they are not only completely unserviceable, but calculated to terribly puzzle and mislead an inexperienced photographer.

Not only the time which such articles as the above have been kept, but the conditions of keeping have to be considered; consequently, manufacturers can only partially protect themselves by marking the date of the manufacture on the package. Still it would be a considerable advantage if every package of perishable photographic material were distinctly marked, *both on the outside and inside*, with the date of manufacture.

Some makers of plates do so mark their packages on the outside, but often the mark is so small that it becomes rubbed off, either intentionally or accidentally.

An account of the first year's working of the Camera Club was before the members at a meeting held on the 16th June, and it was found that the present prospects of the Club are highly encouraging. The Club was started with comparatively few members, and it was carried on for fifteen months on twelve months' subscriptions, consequently a small loss was incurred on the work up to December, 1886, but with the present membership of 340, the financial position is most satisfactory, and there is every reason to expect that the Club will steadily develop, and its usefulness will increase.

Although the Czar of Russia has ceased to take that practical personal interest in photography which he displayed some time since as an amateur of exceptional energy, he still regards photography with favour, and is very fond of showing to his more intimate friends and acquaintances the series of albums in which the photographs, printed from his own negatives, are displayed. There is one album, however, the contents of which he is said to himself look at with especial frequency and interest, though it cannot be said that the portraits it contains are of his own taking. It is, in fact, the Imperial Police Authorities of Russia who have taken not only the likenesses alluded to, but the originals of those likenesses as well. For the album in question, by no means a small one, is nearly filled with the photographic portraits of all the men—and it must, alas! be added women also—who have from time to time conspired againt the Czar with a view to taking his life. Alexander III.'s way of reminding himself that Czars also are mortal is somewhat a morbid one, perhaps, and his example in thus collecting would-be regicides' portraits is certainly one that it would be difficult for any living potentate—save, perhaps, the President of some South American Republic—to follow to any appreciable extent.

But at the same time the Czar's method of classification suggests a way in which the photographic albums of the period might be invested with new interest. Thus, instead of any longer crowding them with portraits promiscuously, a methodical mode of arrangement might be adopted. How interesting, for example, it would be—one might even say how painfully interesting—to devote an album specially to the portraits of all those friends who have borrowed money of us! What amusement, and possibly at some future time what remorse, a confirmed coquette might derive from the arrangement in strict chronological order of the "men she has jilted," whilst the most cynical of old bachelors might derive painful pleasure from the contemplation of the faces, also arranged according to date, of all the women he had ever loved! So, too, one could imagine a crack "trundler" finding delight in collecting the photographs of all the first-class cricketers he had "clean-bowled"; and a good whist player developing a morbid, not to say murderous, tendency by occasionally glaring at the "cartes" of those never-sufficiently-to-be-reviled partners who have coolly and callously left their "signal" unanswered, or trumped their very best card! We might go on and suggest the accumulation by an actor of the portraits of all the dramatic critics who have "cut him up," the inclusion in a severely plain album by a stern and unyielding Radical M.P. of the photographs of all the sprigs of Royalty, German and otherwise, against whose "grants" he has vainly rated in the House; and in fact might continue to make similar suggestions in such numbers that it is quite clear there is scarcely a section of society whose members could not in some way or another develop the notion which the Czar of all the Russias has originated by "albumizing" his would-be assassins.

Francis Galton will doubtless be pleased to hear that the 237 scholars who are in the senior division of one of the best public schools for boys at Harvard (U.S.A.) have been taken in what is known as a "composite" photograph. The resulting portrait is being studied with great interest, for it is regarded as presenting a typical likeness of the rising young educated American of the period. It is now intended to obtain a similar composite portrait of the typical American girl of the time; and it is not at all impossible that the result will be, in this case, a portrait of such combined beauties and composite loveliness that impressionable young Yankees will incontinently fall in love with it. It will be curious to note, too, whether American girls of the period will be jealous of their "composite" rival, or will regard her typical charms with disdain. Meanwhile there is surely a good chance for an ingenious romance writer—Mr. Louis Stevenson would do it admirably—to tell the story of a loving youth who gives his heart fully and unreservedly to this "composite" maiden. We have heard of men pursuing and falling in love with a shadow; we have now to hear how they get on when they become enamoured of a mere type.

THE PHOTOGRAPHIC USES OF NITRITE OF POTASSIUM.

BY H. H. O'FARRELL.*

Mr. W. A. Greene recently exhibited at the Camera Club a specimen of a print which he had taken on bromide paper that had been treated with nitrate of potassium. This is the same paper that is issued with the commercial actinometers, and the possibility of using it for printing out has doubtless suggested itself to many, though I have not seen any specimens other than those exhibited by Mr. Greene. I have lately been making some experiments on the use of nitrite of potassium, both in the paper and in the developer, and having been called on at very short notice to contribute a paper to the Convention, I think a short description of the results may not be uninteresting to those who are working, or would wish to work, in the same direction, though from the limited time at my disposal, as well as from other causes beyond my control, the experiments are far from complete.

The method I adopted was to make up a ten per cent. solution of nitrite and soak the paper thoroughly, leaving it immersed for ten minutes or a quarter of an hour, and then allow it to dry slowly. The paper thus treated behaved in the ordinary way that the actinometer papers behaved, toning to a greyish blue, which deepened afterwards into indigo. By placing the paper between the leaves of a book, and drawing out a portion every five seconds, I found that in strong sunlight the paper attained its maximum density in twenty-five seconds, and that beyond that period no perceptible change occurred.

A portion of the paper, however, which I treated somewhat differently, behaved in a different way. Instead of turning a greyish blue, the paper began with a delicate pink, deepening to a litmus red, and afterwards a brown, before taking on the ordinary blue and indigo tones. Having by me a negative of an individual with brown hair, I conceived the idea of taking a print, with the happy result that by arresting the operation at the stage when the flesh tints had acquired sufficient depth, the hair had toned down to the brown stage, and the coat to indigo.

I conceive some use may perhaps be made of these results, not in colour photography, but in the more limited area of colour portraiture. A paper which gives flesh tints, browns, and indigo blacks, possesses a sufficient range for the portraying of persons other than the ancient Britons, who stained their bodies with woad, or the late Mr. Tittlebat Titmouse, whose hair at one period of his existence assumed a pea-green colour.

At present, however, there is a difficulty to be overcome which is the same that has hitherto proved a stumbling block to all colour photography—the difficulty of fixing the prints by means that will leave intact, and at the same time render stable, the tints obtained. Hyposulphite of soda destroys the colours at once, bringing back the blues to the original pink, and ultimately changing them to a very unpleasant yellowish brown.

Hypo being therefore out of the question, I next thought of sulphite of soda, which has been recommended by Captain Abney as a fixing agent for albumenised prints. To my great satisfaction, I found that the sulphite had no effect upon the colours, and after leaving the prints for about half an hour I concluded they were fixed. So, indeed, they were in the sense that the free bromide had been removed and the image rendered permanent, but the pinks and browns still remained fugitive, and ultimately deepened in strong light to a blue tint.

I have not yet tried other fixing agents, but hope to do so shortly. At present, however, I see no prospect of being able to render the pink or brown tints permanent.

Nitrite of potassium used in small quantities in the developer (about twenty to fifty minims to the ounce of a ten per cent. solution) appears to have a considerable accelerating influence. I exhibit specimens of prints which have had the same exposure, and were developed with the same developer with and without the addition of nitrite of potassium.

I have also tried the effect of soaking plates in the nitrite solution and exposing in the camera. I obtained on a dull day a faint image of the high lights in five minutes, and a badly-defined picture with thirty-five minutes' exposure. The image was, however, capable of intensification or development by a very weak solution of ferrous oxalate—about one part of iron to twelve of oxalate. The result, however, faded considerably in the fixing bath—hyposulphite—but appeared to be capable, after fixing, of intensification with the ordinary ferrous oxalate developer.

I am afraid this paper is necessarily imperfect and sketchy, but I shall be glad if it leads more experienced experimenters than myself to investigate the phenomena. Two cautions are necessary in using this very hygroscopic salt with plates—to immerse the plate in alum before developing in order to avoid frilling, and to use the nitrite solution fresh.

CONCERNING STEREOSCOPIC PICTURES.

BY W. M. ASHMAN.*

The renewed interest evinced of late in methods of procuring stereoscopic rotundity in photographic presentments, appears to the writer likely to prove of such beneficial importance to professional workers and dealers in the material used, that reference to the subject will not, I feel sure, be altogether out of place among the topics ranged for profitable discussion at the Convention meetings.

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* A communication to the Photographic Convention.

That photographers who depend for sustenance upon their financial successes in the practice of the art have suffered severely from the general depression— and possibly other causes —is now an open secret, and if the signs of recovery are not entirely wanting, they are at any rate a trifle obscure and undecided in their character. The best—or an effective—method of circumventing the machinations of the enemy whose identity is so difficult to trace, is the problem which a good sprinkling of the population (photographic) would like to solve.

Doubtless the section of photographers whose interests have been unintentionally imported into these jottings will be supported by abler exponents than myself. I therefore refrain from further remarks in that direction, and pursue the theme which possesses the possibilities of a successful future.

Perhaps some members of the Convention now present have had a large experience in the commercial production of stereoscopic photographs, especially as far back as in the fifties and early part of the sixties, and these gentlemen might possibly add the valuable hints gained in their practical acquaintance with the work to the volume of information disclosed by our good friend Taylor in the last *British Journal Photographic Almanac ;* then we may see the stereoscope in every household long before the nineties are reached. Of this I feel confident, that if such additions are not made to the knowledge already so freely distributed, then it must be assumed that there is nothing further to be said about the matter.

There is one point which has impressed itself upon the writer rather strongly in connection with the subject of making stereoscopic slides, which, under suitable circumstances, might very probably prove of exceptional value as a commercial speculation, and that is the photographic representation of family and other groups in natural positions. Successfully achieved, such a style of presenting portraits would certainly be appreciated, and, in all probability, supplant the flat-looking, very-much-thrown-together-and-heaped-up mass of inanimate form sometimes designated a family group likeness. Whether such a dire catastrophe would indeed follow a perfect, or approximately perfect stereo, little matters now, my intention being to direct notice towards a means of interesting the general public, in order that the fraternity may derive some definite advantage.

Believing firmly in the prospect of a demand for group photographs such as those indicated, I should like to trespass on your patience a step further, and intimate the kind of instrument which I think suited for carrying out the suggestion. The ordinary portrait combination, ranging between four and a-half and six inches focus, will be found as practicable as any. Although it would be inadvisable to use such a lens at full aperture, the employment of a small diaphragm is not only unnecessary, but positively objectionable if one desires to secure soft, harmonious, well-rounded impressions. Then, again, if complete success is to be attained in this class of work, anything short of a commodious and well-lit studio cannot be relied upon. Properties, many and varied, have to be requisitioned, and the means of properly illuminating the same ought to be under perfect control.

With regard to pairs of lenses for securing two images from different points of view at the same time, I must say that I have never met with two instruments absolutely accurate when paired ; there is always something wrong about one of them, either in focal length or brilliancy of image. This may not be the general experience, however.

With the routine of ordinary manipulation I will not occupy your time, but pass to one other form of slide which can be made exceedingly interesting. That to which I desire to draw attention is the subject of interiors of dwellings, churches, and also exteriors generally, such as street views. Many of these, when illuminated and deeply printed to convey the idea of night, afford much amusement. As most of those present know perfectly well, these effects are produced by colouring the back of the print similar to the method of colouring crystoleum. The print is backed up with a suitably coloured ground, and where lights are required, such as candle or gas flames, holes corresponding with the position are punctured with a needle point. Slides of this description are examined by transmitted light like ordinary transparencies.

Sufficient has been brought under notice to raise an opinion on the possibility of progress in the direction indicated, and should these hurried and disjointed sentences fail in their object, to the lack of careful preparation must their failure be ascribed.

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PHOTOGRAPHY FROM ONE POINT OF VIEW.

BY EDWARD DUNMORE.*

It is usually the case when allusion is made to photography to speak of it in its dual name as an art science. Now, for the purposes of this paper, we will ignore the science definition, retaining only the art, thus looking on the scientific side of the matter very much in the same way as a painter or engraver looks on his colours and appliances. I am somewhat doubtful if, by thus invariably linking together of art and science in name, we have not produced a bad effect on photography as an art. Whether or no it has had considerable influence in keeping its artistic qualities suppressed I am not prepared to say. At any rate, photographs are, and always have been, looked upon by many as merely mechanical productions, incapable of expressing a thought, suitable only for producing literally just the matter-of-fact subjects that may be presented to the lens. This is, in my opinion, undoubtedly an erroneous idea. That the photographer has, if he be clever in his profession, the power of imbuing his work with his own individuality in a very marked manner, there is not the slightest doubt. Who could fail to see the man in the works of Rejlander, Robinson, Hubbard, Diston, and others ? This fact is alone sufficient to prove that a camera and lens, skilfully used, is something more than a mere mechanical copying machine. We see by actual work that *picture* making by photography is not only possible, but has been actually accomplished. I speak here in the past tense, by reason of having in my mind the photographs that impressed me most as *pictures*, and which, I have no doubt, many here will associate with the names of the artists I have enumerated. Photography is not easy, by any means, to work as a *picture*-making process. The ease with which an image is obtained is illusory, pictures and images not being synonymous or interchangeable terms. It reminds one of learning the German language, which, at first sight, has many of the words looking so very like English, that we jump to the conclusion its acquirement is very easy, and not until we have dipped into it we find out our mistake, and that the apparent ease is but delusive. The gay and airy manner with which we thought of mastering it is soon dissipated, instead of which we are involved in a struggle with words that is a formidable and unexpected task to the greater portion of those who make the attempt. It is so very much more easy to blame the process when we fail in our attempt at picture-making than to use it. It is no reason, because there are undoubted difficulties in the way, that we should fall back on that very poor excuse for not making good pictures. Certainly not. It has been satisfactorily proved that pictures in every sense of the term can be made by it, and, by patience and perseverance, the difficulties must be overcome ; the more of them, the greater the victory. The well-worn aphorism that "the bad workman blames his tools" is especially applicable to photographers and photography. We know the tools are generally good, and it is our own fault if we do not make good use of them. I sometimes think they may be too good ; and when we see such a display of French polish and ornamental brass work, and the very, very small results, it makes one think perhaps if there were less thought for the apparatus and more for the picture it would not be a bad thing.

It is very difficult to satisfactorily define "art," so general is the application of the word in season and out of season. If a tradesman gets particularly ugly patterns in goods, they are dubbed "art" productions. The elasticity of the term meets all requirements, from a picture to a funeral. So much, then, for the application of the term "art," upon which I will not further enlarge. Then we get "fine art," even a more debateable term than the other, but not quite so universal in its application. It is, however, decidedly more provocative of wordy conflicts. As to the precise meaning of the term opinions differ ; our purpose will be served if we define it as anything beautiful of a more decorative than useful nature, under which head a good artistic photograph may be fairly classed. A photographic picture, then, is an application of the process of photography to represent nature in conformance with the rules that masters in the art of painting and draughtsmanship have laid down as applicable to their particular branches, especially in composition and chiaroscuro. For the present, at any rate, laws relating to the treatment of colour do not particularly concern us, except when colour takes the place of light and shade, and has to be considered in that connection.

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* A communication to the Photographic Convention.

Artistic photographic pictures may be classed under three heads : land or seascapes, *genre*, and still life. Photographs may all be fairly included under one or other of these headings. The landscape into which figures are introduced, if the figures should be so composed as to tell some tale by which the interest will be fairly divided between figure and landscape, has given rise to a variety of opinion as under which head such pictures should be classed. A compromise has been made by denominating them as "landscapes with figures," a style which Birket Foster's water-colours has so admirably exemplified. In these productions we have action and interest in the arrangement of the figures, yet without destroying that of the landscape, which, by its freshness and suitability, claims almost equal attention. In the composition of pictures of this kind, to which undoubtedly photography lends itself, the proportionate size of the figure to the landscape entirely decides the class to which it shall belong. If figures are introduced in the foregrounds and treated in an important manner, we should scarcely call that picture a landscape ; but if placed in or beyond the middle distance, they become subsidiary to the landscape, and the picture may be fairly called a landscape with figures, or the figures may be dropped in the title altogether. There are few, if any, landscapes the interest in which is not increased by the addition of figures. Particular attention should, therefore, be given to their position and arrangement, for awkwardly posed figures in the wrong place will ruin any landscape, however beautiful. The foreground in all landscapes should receive very careful attention, for upon this part of the picture much of the general effect of the work depends : it being close to the eye, and upon a larger scale than the rest, at once challenges, attention. Its arrangement and detail should therefore be most carefully looked to. Many hold, I cannot help thinking, very erroneous ideas as to what constitutes a picture, a "good photograph" being considered synonymous with a "good picture," when, to my idea, they are as far apart as the two poles. However, this is not a suitable opportunity to enter into a long argument as to what constitutes a picture ; suffice it to give a few examples of what do not ; *e.g.*, a photograph of beautiful clouds, although pleasant to look upon, scarcely constitutes a picture in itself, but add the merest strip of landscape that has pictorial interest, and it at once becomes one. A picture must be a combination of several things, each of interest in itself, otherwise it remains a mere photograph ; it may be an excellent representation of the object, but without any claims to pictorial honour. This is a rock on which many get stranded, having the idea that a good photograph of any particular object, no matter what it is, is of necessity a good picture. The sooner this idea is exploded, the better for everybody.

The more skilful the composition, and the better the judgment shown in lighting, the more a work of art a photograph becomes. In these two directions photographers should especially try to improve themselves. Their appliances may be more difficult to work with than those of the painter to obtain results of an equivalent pictorial value, but difficulty should scarcely be an excuse for indifferent work. I would therefore urge the study of art in its various phases by all who have a desire to produce more than mere photographs ; it will not be time thrown away. Can any one suppose any accomplished painter made grand pictures as soon as he knew how to manipulate his colours ? And yet many photographers expect to do so directly they have acquired sufficient skill to make a negative. The idea is absurd. Years of study and practice, and many disappointments, must necessarily be experienced before a clever and finished work can be exhibited for public criticism. Why, then, should the photographer be an exception to the rule, and why should one who has really greater difficulties to contend with imagine he can make a picture (except by accidents, which in all probability can never be repeated) than a man who by laborious study has learnt, after many failures, to properly handle brushes and colour ? The conceit engendered by the ability to make a mere representation of a subject without the most rudimentary knowledge of draughtsmanship encourages the performer to entertain a false estimate of his own skill, a result undoubtedly prejudicial to real progress. True artists will always be in the minority ; it is only here and there a man or woman without, perhaps, any decided manipulatory skill will come to the front by reason of their artistic ability. A more slovenly manipulator or more artistic photographer never lived than O. G. Rejlander. No matter how messy and defective his work from a chemical point of view, the picture was there ; and, had he lived to enjoy the advantages of photographers of the present day, in all probability good manipulation would have been added to his superlative artistic treatment of subjects to which he turned his attention. With the wet plate of his day a man essentially an artist was woefully cramped and handicapped, for to make a complete success you were compelled to think of the plate. When the whole attention should be centred on the subject, this division of interest was a great drawback. Nobody knew it better than Rejlander. Now, however, we can devote our whole attention to the subject, and in the click of a shutter secure any beautiful effect, if we only know how to look for it and to see it when it presents itself. We must see a picture before we can photograph it ; if we do not, it is pure accident, and can never in human probability be repeated. This is a reason why a man's skill should not be estimated on the strength of his producing one superlatively good work, for the veriest duffer is sometimes lucky in this respect, and such having received an overwhelming avalanche of commendation is a spoilt photographer for the rest of his days. The ability to see pictures varies with everybody, and to this we owe the great variery of treatment the same subject will receive at the hands of different photographers. Some are artists intuitively, some by education, and some not artists at all, either intuitively or by education, and never will be. Yet all expect to make pictures. We know they cannot, but it is little use saying so. The few go on and succeed, but the ruck never get beyond mediocrity. As soon as any one is satisfied with his work it is all up with progress ; his ideal standard of perfection is a very low one, soon reached and never exceeded.

In these days of education and opportunity photographers should be amongst the first to take advantage of our art schools, and not rest in snug contentment, fancying they are independent of them because the schools are specially devised for instruction in drawing and painting. The means used may differ, but the aim is picture making, and rules which govern one process will rightly influence another. The knowledge of art is one of the things to which there is no royal road, and it is only by practice, perseverance, and painstaking, that we can hope to see photography raised to that position that it will be no misnomer to call a fine art. Absolute perfection in things mundane is not to be expected, but our endeavour should be to get as near to it as possible. As a proof of how long photographers will be content to run in a groove until startled out of it, we have only to go back to the time of Adam Salomon ; his exhibits were so excellent and so different from anything English photographers had conceived possible. Like a revelation, it could be scarcely credited that by the aid of the well known silver bath and collodion such rich masses of light and shadow could be produced, but they did. Then there was the pose and composition of the pictures ; nobody had conceived portraits arranged with such simple grace and so brilliantly lighted without hardness could be made by photography—but they were. The only difference was, the process was directed by a master's hand, that was all. From the time his pictures were exhibited English photographers began to see the tools they worked with were capable of much more than they had suspected, and a vast improvement in portraiture and artistic management of the picture immediately took place.

With landscape work there is no such thorough revolution likely to take place, for as good pictures were taken years ago as now *of the subjects to which photographers were then restricted.* The most charming effects of light and shade were reluctantly passed. The prompt exposure at the right moment was well nigh impossible, for by the time the wet plate was ready the effect was gone. Photographers were, in consequence, limited to evenly-lighted views. The uniformity accruing from this cause gave rise to the depreciating term "photographic" when applied to other pictures. Now, however, the rapid dry plates have placed the long wanted power of being ready at a moment's notice in the photographer's hands, and any effect, no matter how transient, may be secured. The abuse of such power by exposing on anything that comes must be avoided, and there is no doubt that when the novelty wears off it will be. We now have a grand chance of making real pictures, such that we scarcely did more than dream of formerly ; we have, therefore, a right to expect a corresponding improvement in our work.

THE APPLICATIONS OF PHOTOGRAPHY IN ASTRONOMY.

BY DAVID GILL, LL.D., F.R.S.,*

Her Majesty's Astronomer at the Cape of Good Hope.

Little more than a year ago Mr. Ainsley Common delivered a lecture in this place on the subject of "Photography as an Aid to Astronomy." Given by one who is a consummate master of the art of celestial photography, that lecture—complete as to history and full of suggestion as it was—would, under ordinary circumstances, have precluded further reference to the subject in these Friday evening lectures for some years to come.

But the past year has witnessed such development of the subject, and the importance of photography in astronomy has been so much advanced by the conclusions of the recent Astro-photographic Congress, as to afford a reasonable apology for the present lecture.

On the 16th of April last there was held at Paris a Congress attended by upwards of fifty astronomers and physicists, representing nearly every civilised nation in the world. It was convened for the purpose of considering a scheme of international co-operation in the work of charting the sky on a large scale; or, rather, its object was to obtain a series of pictures which, taken within a comparatively limited period of time, and with the necessary precautions, would enable astronomers of the present day to hand down to future generations a complete record of the positions and magnitudes of all the stars in the heavens to a given order of magnitude The labours of that Conference are now concluded, certain important resolutions have been adopted, and the way has been so far cleared for giving these resolutions practical effect.

It seems of importance, therefore, to lay before the members of the Royal Institution some account of the history of this remarkable Congress, to illustrate and explain the grounds of the conclusions which it has arrived at, and otherwise to bring the history of photographic astronomy up to the present date. I pass over the already well told early history of celestial photography, except in so far as it relates to star charting. It was Warren de la Rue who first called attention to the means furnished by photography for charting groups of stars. In his Report to the British Association at Manchester, in 1861, on the progress of celestial photography, he indicates a photographic object-glass of short focus as the instrument best suited for the purpose, and he states that by mounting such a lens and camera on an equatorial stand provided with clockwork, he has photographed such groups of stars as the Pleiades, the chief difficulty being not to fix the images of the stars, but to distinguish them from the specks which are found on the plates, or rather in the collodion.

In 1864 Rutherford, of New York, completed a telescope of 11½ inches aperture and 14 feet focal length, specially constructed for celestial photography, and obtained fine photographs of stars to the 9th order of magnitude. His remarks, although quoted in Mr. Common's lecture last year, have such importance on the present subject that I venture to repeat them:—

"The power to obtain images of the 9th magnitude stars with so moderate an aperture promises to develop and increase the application of photography to the mapping of the sidereal heavens, and in some manner to realize the hopes which have so long been deferred and disappointed.

"It would not be difficult to arrange a camera box capable of exposing a surface sufficient to obtain a map of two degrees square, and, with instruments of large aperture, we may hope to reach much smaller stars than I have yet taken. There is also every probability that the chemistry of photography will be very much improved, and more sensitive methods devised."

Mr. Common well remarks that in the light of recent work these words are almost prophetic.

But Rutherford did not stop here. In the eyes of an astronomer a picture of stars is of comparatively little importance unless it is capable of accurate measurement. Recognising this important feature of the case, Rutherford devised a suitable apparatus, which he applied to the measurement of two of his photographs of the Pleiades. These measures having been put into the hands of Dr. Gould, that astronomer compared them with those of the same group of stars made by Bessel with his celebrated heliometer, and found a satisfactory accordance.†

Encouraged by these results, Dr. Gould, when he went to the Argentine Republic in 1870 to found the Cordoba Observatory, which has since been rendered so famous by his labours, took Rutherford's telescope with him. Unfortunately one of the lenses was broken in transport, and such delay was incurred in replacing it, that the proposed work could not be begun till 1875. But thanks to the clear skies of Cordoba, and the marvellous activity of the observatory under Dr. Gould's direction, 1350 photographs were obtained in course of a few years, containing representations of all the principal star-clusters of the southern hemisphere, besides a special series of plates taken for the purpose of determining the parallax (or distance) of several of the more remarkable stars in the southern hemisphere.

This fine series of pictures is now being submitted to measurement by Dr. Gould, and the results are awaited with the greatest interest by all astronomers.

The first of Dr. Gould's plates were taken with the old wet collodion process, but the work was afterwards greatly facilitated by employment of the more sensitive modern dry plates.

It was, in fact, the introduction of the gelatine dry plate process in 1876 which really paved the way for the rapid development of celestial photography. The convenience of the manipution and the great increase of sensitiveness of the plates at once placed a new power in the hands of astronomers. Draper photographed the nebula of Orion in 1880; and after trials, commencing in 1879, Common succeeded in obtaining the exquisite photographs of that object which have been exhibited more than once in this theatre.

In 1882 appeared the splendid comet of that year. At the Royal Observatory, Cape of Good Hope, we were not at the time engaged in photographic operations. Several photographers in the Cape Colony found it possible to obtain impressions of the comet, but they were unable to secure pictures of scientific value, because they were unprovided with means to follow the diurnal motion. I had no available camera belonging to the observatory, and no experience in the development of modern dry plates. In these circumstances, I applied to Mr. Allis, a skilful photographer in my neighbourhood, who eagerly consented to co-operate with me in the work. I arranged means to attach his camera to the stand of an equatorial telescope, and the telescope itself was employed to follow the nucleus of the comet accurately during the whole time of exposure by the aid of the driving clock and with small corrections given by hand. The lens employed had an aperture of only 2 inches, and a focal length of 11 inches; but the result was a series of pictures, one of which, obtained after an exposure of two hours, is now on the screen.

The photograph shows a very satisfactory delineation of the tail and envelope of the comet. Important and useful as these results were, there was another feature of the pictures which seemed to me still more so. In forwarding copies of these photographs to the Royal Astronomical Society of London, and to the Paris Academy of Sciences, I drew particular attention to the large number of stars shown upon the plate, and insisted upon the importance of the means thus offered to photograph comparatively large areas of the sky, and thus rapidly make charts of the entire heavens.

The one step wanting was now provided, and the new and more sensitive dry plate rendered the former suggestions of de la Rue and Rutherford now valuable and practicable.

Formerly the old collodion wet plates required large instruments (with small field) and long exposure to depict stars even to the 9th magnitude, and astronomers trusted entirely to the accuracy of their driving clocks, which could not follow a star with perfect accuracy during a long exposure. Now the modern rapid dry plates, in conjunction with the large fields of the photographic objective, overcame the first of these difficulties, and the plan of employing a guiding telescope overcame the second.

The use of a guiding telescope was not even a new device, for it had been employed long before by Hartnup and others, who, in their early attempts to photograph the moon, kept the image of a lunar spot by hand upon the cross wires of the finder of the telescope during the long exposures then necessary.

There was thus nothing really new either in my suggestion or in the *modus operandi*, only the result was a fortunate one, for Mr. Common says that "these photographs came to him as a revelation of the power of photography for the purpose of star-charting,"* and Admiral Mouchez tells me that these Cape

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* Communication to the Royal Institution.

† Astron. Nach., No. 162, vol. xlviii., Dec. 1866.

* Proc. Royal Institution, vol. xii., part iii., p. 734.

PATENT OFFICE LIBRARY

photographs and my suggestions first directed his attention and that of the brothers Henry to the application of photography to the work of star-charting, which had for many years been carried on at Paris by the older methods of astronomy.

Common was amongst the first to take up the work in England, and here on the screen is one of his photographs with a 4-inch lens executed in December 1883. But being engaged in other researches, Common made no attempt to commence a systematic survey of the heavens.

Isaac Roberts, of Liverpool, was also early at work in the same field, and after preliminary experiments he acquired a powerful telescope, with which he began a systematic survey of the northern heavens.

It required some time to find the necessary means and apparatus to begin the realisation of my ideas at the Cape, but at last the work was started in the beginning of 1885 on the following definite plan, viz., to complete the cartography of the heavens from 20° south of the Equator to the South Pole, and so as certainly to include all stars to the 9th magnitude.

(To be continued.)

Patent Intelligence.

Applications for Letters Patent.

9159. Johann Bartos and Hermann Kuhn, 46, Lincoln's Inn Fields, for "Improved process for producing grained relief and intaglio clichés from photographs."—28th June, 1887.

9220. James Arthur Richards, 127, Long Street, Sparbrook, Birmingham, for "An improved adjustable stand for holding glasses to exhibit photos, cards of every description, and all articles of like nature."—29th June, 1887.

9341. Alfred Pumphrey, 128, Colmore Row, Birmingham, for "Improvements in combined changing boxes and dark slides for photographic purposes, and in portable dark chambers for use therewith.—1st July, 1887.

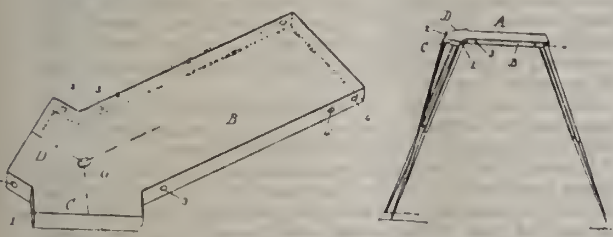
Official Abstract of Accepted Complete Specifications.

Edwards, 11,231, 1886. "Sensitized plates, films, &c." Machine for cutting photographic plates; adjustable guides for tool and plate; weighted tool holder.

Gaedicke and Miethe, 7035, 1887. "Artificial light." Powdered magnesium mixed with chlorate, nitrate, &c., and prussiate of potash, phosphorus, &c.

Patents Granted in America.

364,629. Thomas H. Blair, Boston, Mass., "Tripod-top for photographic cameras."—Filed January 22nd, 1887. Serial No. 225,146. (No model.)



Claim.—1. In a tripod, the combination with the tripod legs removably attached to the tripod top, of a tripod-top formed with two short arms C D, and a long arm B, the rear tripod leg co-operating with the latter, being adjustable toward or away from the central bolt-hole *a*, substantially as and for the purposes herein stated.

2. The combination with a tripod-top to which are removably secured tripod legs, of a leg adjustable toward or away from the bolt which secures the camera-box, substantially as described.

3. A tripod-top A, formed of the arms B, C, D, provided with the bolt-hole *a*, and laterally pierced at 1 1, 2 2, 3 3, 4 4, by which to secure the legs upon which it is mounted, as set forth.

Correspondence.

PHOTOGRAPHY AND SILHOUETTES.

Sir,—My new suggestion for the commercial development of photography is appropriate to your columns. I therefore ask you to let me address your readers on the subject of black silhouettes. They were very familiar to those who lived in the pre-photographic period. They were quickly cut out of paper by a deft hand with a small keen pair of scissors, and at least one of the many operators in this way ranked as an artist capable of making excellent likenesses. The paper was black on one side, and the silhouette that had been cut out was pasted then and there, with the black side upwards, upon a white card, and framed. A perfectly durable, and often a good likeness was thereby produced in a very short time. This art was superseded by photography, and is now temporarily extinct; but I want to show that it might with great facility—and, I think, with some profit in a humble way—be advantageously re-introduced by the help of the very agency that extinguished it.

I will explain what I myself did, beginning, as one always does, in the wrong way first, and afterwards getting right. I wanted, for some experimental purposes of my own, to obtain a large number of silhouettes; in fact, I wanted photographs of such cleanly-cut profiles as most persons have had occasion to see, of those who stand in a long dark passage between themselves and an only window at the end of it. I therefore arranged a makeshift dark tunnel. At one end was the camera; in front of the other end was a white sheet inclined to the light, and in the tunnel was the sitter for the time. As viewed in the camera, the appearance was that of a field of brilliant white, out of which was sharply cut so much as corresponded to the silhouette of the sitter's face. A rapid exposure sufficed, and I thereby got a white silhouette upon a black ground, which might be used as a negative to produce black silhouettes on a white ground. They served my own particular purpose perfectly, but they had not the clean and sharply-contrasted effect of the old silhouettes; so I cut some of them out of the paper and blackened them, and pasted them on cards. If I had blackened them with aniline ink, I could have produced papyrographed copies; or if I had greased them, and pressed them on stone or on zinc, the lithographer could have worked off copies by the hundred.

My suggestion lies in this last direction. It is, that the photographer, without taking any trouble to construct a tunnel as I did, should photograph on paper the profile of the sitter, either in strong light against a dark background, or *vice versâ*; to develop sufficiently to see the image clearly, and then to wash for a second, but not to fix, and rapidly to dry it in the dark; next in full, but somewhat non-actinic light, to quickly cut out the silhouette before the image has time to fade; lastly, to (*a*) blacken the silhouette, dry and mount it; or (*b*) grease it, press it on a small lithographic surface, and thence to take as many prints as are desired. The whole of the latter process need occupy very few minutes, and the sitter could walk away in possession of his or her likenesses.

Now the merits of this plan are, that no artistic, and little photographic skill is required; there is no need for a careful adjustment of exposure of lights, and of position, or of accessories; there is no necessity for careful development. The carrying out of the process requires no skill except so far as the cutting out is concerned, which any neat-handed person can soon learn to do quickly and well. The arrangements for rapid drying, and for the various printing operations, might be of the humblest description, and yet a really useful and pleasing likeness might be turned out, far superior in value to the commoner kind of photographs, and to not a few of the more costly ones. The rapidity and cheapness with which lithographed copies could be supplied would be incomparably superior to anything that photography can effect. The cost of outfit for experimentalizing, if a lithographer can be induced to help in the first instance, does not exceed that of a pair of sharp lace-cutting scissors; and it would, I think, be well worth the while of an enterprising photographer who is slack of work to attempt to establish and supply a demand for prettily-mounted silhouettes.

Francis Galton.

MAYALL'S PATENT.

Sir,—In the News of July 1st, I see that Mr. Walenn signs himself as "Abridger of 'Photographic' and other Specifications of Patents to the Hon. the Board of Trade." Doubtless Mr. Walenn has abridged specifications relating to photography for the Patent Office, but it is due to the Abridger of the last volume of "Abridgments of Specifications relating to Photography," published in 1885 by the Patent Office, to state that Mr. Walenn had no connection whatever with that volume.—I am, yours, &c.,

Chapman Jones.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on the 30th ult., A. Mackie in the chair.

The Hon. Secretary proposed the adjournment of the business of the Annual Meeting for four weeks, when he hoped several members who had gone to the Convention would have returned. This course was adopted, and technical matters were considered. The cause and prevention of iridescent stains at the margin of plates was discussed.

W. E. Debenham said it would not occur if the plates were packed closely and hermetically sealed. The marks could be removed by rubbing gently with water.

The Chairman used a pad of cloth moistened with turps, and in a batch prone to the evil he soaked the plates a couple of minutes in ammonia and bromide solution, afterwards adding pyrogallol to perform development. This plan he had never known to fail.

Some remarks upon fixing paper negatives followed. The proportion of sodic hyposulphite to water which was recommended ranged from eight ounces to one pound of the salt to each pint of water; clearing in alum before fixing was said to prevent an effective action of the latter process in the case of certain gelatines.

Rendering paper negatives translucent was then talked about; vaseline and other paraffins being favoured by various speakers.

Attention was directed to an article in the *Photographic Times* (New York), signed by H. P. Robinson, wherein it set forth that the writer had heard good accounts, from different quarters, of a lens coming into great use in the States, named "The Wale." The question was asked whether anyone had seen or heard anything of the capabilities of this lens.

W. H. Prestwich thought it was made in Paris.

W. E. Debenham supposed the lens named by Mr. Robinson to be an imitation of Steinheil's Aplanat, and similar to those manufactured in Paris, and sold under different names in this country.

W. M. Ashman remarked that the Scovill Company were agents in New York for the Wale lens.

R. S. Kidd said the best Jubilee yacht race views he had seen were taken by Captain Clark, who used a 16-inch focus lens and 10 by 8 plates.

This led to a discussion, in which a focus equal to twice the length of the plate was preferred for instantaneous work.

The Hon. Secretary drew attention to a newspaper paragraph referring erroneously to Photographic Societies. He said they regarded reports of meetings purely as advertisements.

W. E. Debenham: If they would stick to that it would not matter, but experience shows it is not the fact.

Mayall's process and the Abridger's report thereon was severely criticised. Tint oleo and other speculative transactions having some connection with photography were likewise referred to, and it was suggested that photographic societies should take joint action whenever necessary to prevent misrepresentation.

Liverpool Amateur Photographic Association.

The monthly meeting was held on the 30th ult., at the Royal Institution, the President, George H. Rutter, in the chair.

Vero Driffield was elected a member.

The Secretary distributed the circulars of the exhibition of the Royal Photographic Society of Ireland; he also read a letter from the Secretary of the Royal Meteorological Society, asking for photographs of lightning flashes, and calling the attention of amateur photographers generally to the subject.

R. Crowe remarked that he believed he had taken the first negative in existence of a lightning flash, and would be pleased to let the Meteorological Society see it. He recommended from his experience, not a rapid rectilinear with full aperture, as advised by the Secretary of the Meteorological Society, but a single lens with aperture not exceeding $\frac{f}{8}$, on the ground that the lightning flash is quite actinic enough to impress itself with the smaller aperture, whereas with the large aperture the plate would be generally fogged by the amount of diffused light present whilst waiting for flashes to occur.

J. Rutter exhibited, on behalf of Messrs. Lange and Mayne, some fine prints in platinotype, also three prints, for comparison, of same negative, one platinotype and two Obernetter's paper, one of which had been squeezeed on glass, the other on ground glass, so as to compare the effects of enamelled and matt surface. Mr. Rutter also exhibited and explained a Gotz half-plate camera and Morgan and Kidd's roller slide with Rogers' indicator and attachment for employing Eastman rollers.

Dr. Kenyon exhibited a number of very fine 12 × 10 enlargements on Eastman gelatino-bromide paper from quarter-plates and Eastman stripping films, some of which were taken on the Rossett excursion.

W. A. Watts read a paper entitled "Notes of a Visit to the Autotype Works."

Some discussion arose about the difficulty of estimating exposure in carbon printing, some members thinking the reader of the paper had not attached sufficient importance to the difficulty.

W. H. Kirby remarked that with a little practice the difficulty disappeared altogether.

Dr. Kenyon read report of the Rossett excursion, from which it appeared that eight members took part, and that seventy plates were exposed.

Dr. Kenyon and B. J. Sayce exhibited some results.

A. W. Beer reported on the Bolton Old Halls excursion, visiting Turton Tower, the Hall in the Woods, and Smithells. Five members were present, the day being lovely, and from fifty to sixty negatives were obtained.

Mr. Rutter reported that the Broxton and Carden Halls' excursion took place on June 25th, in charming weather, five members and two friends taking part in the excursion. It was found at the end of the day that fifty-nine exposures had been made, both plates and paper being used, the former being Ilford, Rouch's, Thomas's, Edwards', and Derwent, whilst the paper was Eastman's ordinary and stripping films.

The adjourned discussion on "Paper *versus* Glass" was then opened by B. J. Sayce, who claimed for paper films the advantage on several grounds. He said he had worked on glass many years, but had recently adopted paper, and was quite satisfied with the results, in proof of which he showed a number of prints from negatives both on glass and paper, in many cases of the same subject, and in no case was there any inferiority on the side of paper, while in some it was distinctly superior. He claimed for paper the advantage—1st, In weight. 2nd, Facility for changing, and therefore for securing a considerable number of negatives in an excursion—the only difficulty was the number of routine operations to be performed, but that could be overcome by systematic arrangement; he employed, himself, a notebook containing space for initials when wound off. 3rd, Development: he found great latitude, more so than glass; there was some liability to spots, which were quite avoided by the use of plenty of water before development. 4th, Rapidity greater than glass. 5th, Freedom from halation, in illustration of which he showed two prints, one from paper, the other from glass, of the interior of Gresford Church, in which the paper negative was quite free from halation.

R. Crowe, on the side of glass, stated that he admitted for paper the one great merit of portability, but with regard to freedom from halation he did not think the film or the nature of the material had anything to do with it; the cause of halation was over-exposure, in support of which view he showed several negatives on glass subjects likely to produce halation, but which were quite free from that fault, one in particular of a glass roof with iron supports. He also maintained that the same amount of minute detail could not be obtained on paper as on glass, and showed several negatives containing a large amount of minute detail, which he did not believe could be matched on paper.

Dr. Kenyon attributed the freedom from halation shown by paper to the rapidity of development by which it was characterised.

F. Lewis complained of the want of flatness in the Eastman carriers.

W. Kirkby was in favour of paper; he found it more rapid than glass. He advanced the theory that the reason paper is quicker than glass is because in the latter the particles of emulsion are in a state of strain, whereas in paper it is not so.

Prints and work were exhibited by Dr. Kenyon and Messrs. Sayce, Tomkinson, Ryley, Crowe, Lange, and Mayne, and, after an interesting discussion, the meeting closed at a late hour.

Society of Amateur Photographers of New York.

Regular meeting, May 11, 1887.

The President, Dexter H. Walker: In order to start the discussion, I will read a paper, which may be of some interest to you, which was written by Lieutenant C. L. Bruns, of the United States Navy, who is now present, and who requested me to read it. The paper is entitled "A Paper on the Proper Time for the Exposure of Dry Plates" (see p. 420)

The President: Since Lieutenant Brun's paper was written, I have been experimenting further, and I have formulated the following as the result (see p. 421).

Mr. Newton: Now, Mr. Chairman, the plate you exposed thirteen seconds produced the same negative as the one that was exposed four seconds, did it?

The President: No, sir; you have made a mistake in regard to the time of the exposure. I said thirty seconds. As I understand, you want to know if that thirty seconds' exposure gave us as good a negative?

Mr. Newton: I want to know whether it gave the same negative as the plate that was exposed four seconds gave. That is what I desire to know.

The President: Precisely.

Lieutenant Bruns: You said that was a supposcable case. You are simply illustrating the rule.

The President: I say that if a plate was exposed thirteen seconds, that we should get equally as good negatives with an exposure of that length of time as you would with the one that was exposed four seconds.

Mr. Newton: You didn't do that?

The President: No, but I have tried it in the room upstairs, where we exposed one eight minutes on this theory, when everybody standing around said, expose it from forty seconds to an hour and a half. At four o'clock this afternoon we were exposing this plate, not thirteen seconds, but we exposed it after making the calculations I have given you, and following them, exactly eight minutes and forty-four seconds.

Mr. Frisbie: You mean by adopting the idea suggested in your paper you can get the exact time to expose your plates?

The President: Yes, any time of day. This paper which I have just read involved an immense amount of figuring, and I do not conceive that there is any possible way by which this could be put in any other shape than it is. Lieutenant Bruns and myself read it over, and it is as brief as it can be stated. To arrive at these figures was a matter of considerable trouble. You have no idea of the amount of labour involved in the work. You don't have to expose a plate every day. You go out and take a picture to-day, for instance, and find that a clear brilliant sunlight actinizes paper in a given time. You may take that time as the basis for several days' work.

Mr. Atkinson: Suppose there is no sunlight.

The President: Then you do not expose the paper.

Mr. Atkinson: Then you cannot tell anything about it. I merely say that, because for four years I used that very test in printing carbon prints. I had a small negative with a printing frame marked from number one to number twelve, and there was a slip of sensitized paper placed in that, and there have been times when I got fair negatives, but I consider it very unreliable.

The President: In regard to the constant (by which I mean the non-variable figure) upon which all this is based, the sensitized paper is exposed when the sun shines, and you get a figure which, as I say, lasts you all the year round. It is immaterial whether the sun never shines again. You have got nothing to do with that. You do not have to ascertain a new constant, you use the same one. But you expose a piece of sensitized paper to the light, whatever that light may be, and that gives you the second figure in your problem, by which you arrive at the third.

Lantern Slide Exhibition of May 25, 1887.

The President (D. H. Walker) announced that it had been determined that the entire evening should be devoted to the projection of the pictures upon the screen, without criticism. That Friday evenings, previous to each exhibition, had been fixed on for testing the merits of slides, and at that time free criticism would be permitted. Some members had expressed themselves as very sensitive upon this point, which will explain the change indicated above.

Mr. Walker announced that the next exhibition of lantern slides would take place on Wednesday evening, June 1st, when Edward Leaming would show and explain a series of about 100 pictures taken during a recent trip through the Windward and Leeward Islands, which would no doubt be of great interest. The President also announced the election of the following members: C. M. Perry, Thomas D. De Witt, Caroline B. Schwab, Dr. C. H. Hoagland, and Leland H. Ives. The screen was then put in place and about 100 slides of foreign and domestic views were shown, to the great delight of the large audience. Among the peculiarly interesting slides were those of H. W. Gridley, they having been made on collodio-bromide plates prepared by himself for his own negatives. About twenty slides were by English amateurs and were much admired, as were those of the Pittsburgh Amateur Photographic Society.

Meeting June 1, 1887.

The President (Dexter H. Walker) stated that, as the season was drawing to a close, it was intended to give an additional exhibition on June 8th, of a number of lantern slides now in process of being prepared by him from negatives by Lieut. Howell, U.S.N., a member of this club, consisting of views in China, Japan, Siam, and Corea. He desired to call special attention to these, as they delineated a people with habits almost unknown to us, and therefore curious in the extreme.

The exhibition was generally declared to have been one of the most pleasing ever given by the Society. During the recess Mr. Walker took occasion to remark upon the intensity of the light in the localities mentioned, having frequently visited those parts; and to warn all amateurs who intend going to equatorial regions to be cautious in the exposure given plates. The roadways, walls, and houses are all white, and reflect the rays of the sun with the greatest intensity; and to secure good results the smaller stops should be used in any camera, whether detective or not. The atmospere is so clear that even the moonlight has a peculiar appearance, as if it had body to it, and as for the moon itself, it appears as if you could almost touch it.

Talk in the Studio.

The Photographic Convention.—In addition to the information on p. 417, our correspondent sends us the following:—Two excursions were fixed for Tuesday—one to the Trosachs, some forty miles north of Glasgow, amidst the most beautiful scenery of the Western Highlands; and the other to the Falls of Clyde, via Hamilton, a nearly equal distance to the south of St. Mungo's city. About fifty-five patronised the former, which was under the leadership of T. N. Armstrong; and fifteen the latter with Geo. Bell. The weather was of a very varied description, embracing rain for both parties, and a thunderstorm for the southern division; but there was plenty of intervening sunshine, and everyone returned highly delighted with their rambles through places long ago made classical by the pen of Scott. About sixty members and friends assembled in the Institute of the Fine Arts at 7.30 p.m., John Stuart, President of the Glasgow Photographic Society, being in the chair. J. T. Taylor then read a series of papers referred to on p. 418. J. J. Briginshaw (hon. sec.) read the following letter from the Photographers' Benevolent Association, recommending the objects of the Association, and asking for assistance. "We the undersigned have been deputed by the Committee of the Photographers' Benevolent Association, to bring under the notice of the Photographic Convention of the United Kingdom at their meeting at Glasgow, a statement setting forth certain claims the Institution has upon the fraternity. The Benevolent fund was inaugurated in 1873 with the sole object of helping indigent and infirm members of the craft who were found to be deserving of substantial sympathy ; such cases as those arising from sickness, death, or prolonged lack of employment being considered tobe eligible. From the commencement of the Society's labours up to the present, bona fide applicants whose contributions entitled them to benefit have been as liberally dealt with as the funds at the disposal of the committee for the time being justified, or was deemed adequate. The Society has thereby greatly lightened the tax imposed on individuals who might otherwise have been called upon to dispense private benevolence under circumstances sometimes the reverse of agreeable. Much remains to be done in order to carry out the intentions of the promoters, especially in the direction of the education of orphans, and giving annual pensions to the aged. For these special objects, as well as assisting in the general scheme, the Committee appeal, through the members of the Convention, to all interested in photography, whether actively engaged therein or not, to aid them in their endeavour to build up an institution worthy of the present status of our profession. The first step towards attaining this much-desired end is to strengthen the hands of those already engaged in the work, by each and all entering heartily into the spirit of doing good unto others. An annual subscription of 2s 6d. constitutes membership, and this sum is so insignificant that no one one could with any semblance of truth be found to say that such contribution was beyond his means. In case there be any misconception, it may be at once stated that the funds have not accumulated to their present state with such small payments, but from the generous donations cheerfully given by amateurs and the more wealthy members of the profession. Donors of one guinea per annum are entitled to the privilege of recommending deserving cases of non-members for the consideration of the committee, in addition to possessing equal rights in controlling the management of the Society with ordinary members. The association is registered under the Friendly Societies' Acts, and it may further be stated that a thoroughly representative committee of twelve members of the Association, jointly with the following gentlemen, guide the fortunes of the Institution,—W. M. ASHMAN, EDGAR CLIFTON." J. T. Taylor exhibited a portrait of himself coloured by Mayall's process ; as to which he was assured by the Company that it had never been touched by *an artist*. So bad was the colouring that he firmly believed the statement.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—There will be an excursion on 9th inst. to Winchmore Hill. Train from Moorgate (G. N. R.) 2.26 to Winchmore Hill Station.

SO-CALLED ARGENTOUS COMPOUNDS. By W. Muthmann (*Ber.*, 20, 983—990)—A microscopic examination of the crystals obtained by dissolving silver molybdate, chromate, tungstate in ammonia to saturation, heating at 90°, and passing hydrogen for some time (Rautenberg, *Annalen*, 114, 119), shows that they consist of the unaltered salt crystallised with very finely divided metallic silver. Addition of ammonia dissolves the salt and leaves metallic silver undissolved ; and if in the foregoing process ammonia is constantly added to replace that removed by the passage of hydrogen through the ammoniacal solution, only finely divided silver is obtained instead of the so-called argentous salts. Silver citrate when heated at 108° decomposes with the formation of metallic silver, and the aqueous solution is not coloured red ; when the salt is heated at 100° in hydrogen, argentous citrate and citric acid are not formed as stated by Wöhler and v. Bibra (*Annalen*, 30, 3), but decomposition-products of citric acid, (comp. Trans., 1887, 416) and finely divided silver are obtained together with unaltered salt. The product, contrary to the behaviour of so-called argentous salts, dissolves in ammonia without decomposing into finely divided silver and the corresponding silver salt ; the solution is clear, intensely red, and feebly fluorescent, and when largely diluted with water appears transparent and grass-green by transmitted, but opaque and violet by reflected light. The colour of the solution is not due to the presence of argentous salt, but of finely divided silver ; it is instantly destroyed by the addition of acids or salts such as potassium nitrate and sodium sulphate or acetate, and silver is precipitated ; shaking with recently ignited animal charcoal removes it, and on dialysis of the solution a deposit of silver is found on the membrane of the dialyser. Addition of gum-arabic to the red solution and subsequent precipitation with alcohol removes the colour, and the precipitate gives a red solution with water ; moreover, when it is kept at—12° for some hours, and the ice formed subsequently melted, a liquid is obtained which is no longer red and transparent, but black and opaque, and deposits finely divided silver on standing. The author concludes, therefore, that argentous salts do not exist.

PHOTOGRAPHIC CLUB.—The subject for discussion on July 13th will be "Extemporising Apparatus in case of breakdown when away from home." Saturday outing at Winchmore Hill, train from Moorgate Street at 2.26.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C. ;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

NEMO.—We cannot tell you how the firm in question does the work ; but if you take an impression from type on litho-transfer paper, using thick ink, and transfer this to the varnished surface, the result should be satisfactory. In transferring, very slighly damp the paper, rub down into contact, and then soak off the paper by tho cautious application of water with a camel's hair brush.

T. W. O.—We should select No. 2 or No. 5, and, as far as our experience goes, there is absolutely nothing to choose between them.

LYD SAWYER.—As it refers exclusively to matter which has appeared in another photographic periodical, it would be out of place in our columns.

COLLOTYPE.—There are no complete instructions published in English, that is to say, complete in the sense of not assuming a general knowledge of photographic work. All that is new on both subjects has appeared in the PHOTOGRAPHIC NEWS. If you read German, you should obtain Husnik's "Lichtdruck," and "Reproductions Photographie," by the same author. Each costs three or four shillings, and they are published by Hartleben, of Leipzig. You can order them from Williams and Norgate, of Henrietta Street, Covent Garden, or Trübner, of Ludgate Hill.

SEA.—They are, we believe, due to particles of dust on the paper ; these having screened off the light, and become removed on soaking in the solution. Probably you will find these firmly adherent to the paper as you purchase it.

J. MCNAB.—Consult some handbook of photography. Abney's "Instruction" is one of the best.

MARS.—Explain more clearly what it is that you require.

AMBITION.—We cannot recommend you to do as you propose, because the American photographic publications generally belong to firms of apparatus dealers ; and you would doubtless be expected to puff their goods.

TRIX.—About fifteen cells.

AN OLD SUBSCRIBER.—We are under the impression that Sands and Hunter, of Cranbourne Street, are likely to do what you require.

E. H.—It seems to us, even on your own showing, that you are altogether in the wrong. Try to imagine yourself in the position of the other party.

Photographs Registered.

MARSHALL WANE (Edinbro')—Photo. of Earl of Hopetown ; 2 Photo Groups of Earl of Hopetown and his Suite.

W. J. BYRNE (Richmond)—Photo. of Dr. Lette.

T. C. TURNER (10, Barnsbury Park, N.)—10 Photos of Victoria Hotel, London

F. M. RAMELL (Sittingbourne)—2 Photo Groups of Kittens.

J. A. KAY (Bolton, Lancaster)—2 Photos. of T. Fletcher, Esq.

The Photographic News.

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INTENSIFYING WITH MERCURY AND SCHLIPPE'S SALT.

In view of the necessity with which the photographer is so frequently confronted, for increasing the intensity of the negative as it appears after development and fixing, and of the uncertainty which most of those who have used it experience of the permanency of the deposit left after intensifying with bichloride of mercury followed by ammonia, or with iodide of mercury with or without the addition of a small quantity of hyposulphite of soda, it is certainly desirable to have a means of obtaining intensity readily, and of sufficient amount, which shall not be open to the same grave objections that attach to the ordinary mercurial methods. In our own experience, we have found a satisfactory means of accomplishing our requirements by fixing the mercurial deposit, as recommended by W. E. Debenham, with a solution of sulphantimoniate of soda—a salt generally known as Schlippe's salt.

In the wet collodion era the use of bichloride of mercury, followed by that of a solution of Schlippe's salt, was not uncommon as a means of obtaining intensity, although perhaps it was principally employed when copies of line work, or subjects requiring great density, were in question. With subjects of this kind, the red colour given to the deposit was not a matter of consequence; but for portraiture there is not only the difficulty of properly estimating the value of intensity when the deposit is of an unusual colour, but the retoucher is not so well able to judge of the effect of his work, and, moreover, long-continued looking through a red medium is found by some to cause considerable strain upon the eyesight.

With gelatine negatives, there is not only the objection to the use of bichloride of mercury followed by Schlippe's salt, which arises from the redness of the deposit; but, as pointed out by Arnold Spiller, bichloride of mercury forms a compound with gelatine, so that no matter how much washing may be given to the film after its use, there remains a certain amount of a mercury compound which, on the application of the sulphantimoniate solution, will show as a yellow or orange stain all over the negative. According to the same authority, the formation of this mercury-gelatine compound may be prevented by acidifying the mercury with hydrochloric acid before applying it to the plate.

In making up a solution of iodide of mercury for intensifying, it is convenient to use a saturated solution of bichloride of mercury, and a rather strong solution of iodide of potassium. Half fill a measure or other vessel with the mercury solution, and pour in that of iodide, stirring the while with a glass rod until the red precipitate which first forms is re-dissolved by the excess of the iodide of potassium. As some guide to the proportions required, we may say that if the iodide solution be of the strength of one in five, it will require about three and a quarter ounces to re-dissolve the mercury contained in ten ounces of saturated solution of the bichloride. If there be a slight excess of mercury there will be a little precipitate left which will do no harm unless it be allowed to adhere to the film. On the other hand, we have not found any objection to a slight excess of the iodide, but large excess should be guarded against. We have now a very strong solution of iodide of mercury, which for ordinary use may be diluted with from two to four volumes of water.

The first essential to success with the method under consideration is that the negative shall have been thoroughly fixed. It is well known that there is some silver compound in a gelatine plate, which takes longer to be dissolved out in the hypo than the bromide of silver itself does. As soon as the bromide is dissolved (and the iodide if there be any), the plate appears to the eye to be fixed, but if removed from the hypo bath, the instant that it looks clear—especially if the bath be an old or weak one—the transparent silver compound to which we have referred will not be removed, but will remain to show itself at some future time. Most, if not all, photographers will be able to call to mind the case of some negative which appeared quite clean and clear at first, but which has acquired a reddish brown stain, in some part, due to the gradual darkening of this undissolved silver compound. A good plan, and one often followed, is to leave the plate in the fixing bath for about twice as long a time as it takes for visible fixation.

Assuming the plate to be thoroughly fixed and washed, the iodide of mercury solution is applied until nearly, but not quite, sufficient intensity is gained. The reason for stopping short of the intensity actually desired is, that the subsequent treatment will somewhat increase the opacity of the deposit. The mercury solution, if used in a dish, should be kept in motion to prevent the formation of peculiar ripple-shaped markings. Should these markings, however, occur, they will disappear as intensifying goes on, but then too great density may have been given, in which case it must be lowered as will be described further on.

When it is considered that the iodide of mercury solution has acted as much as desired, the plate must be rinsed under the tap, and then well washed. In our own practice we have found that if the plate after rinsing is placed in one of the vertical washing troughs now so common, it will be ready for the next operation in a time varying, with the thickness of the gelatine coating, from a quarter of an hour to an hour. It is safest to allow the last mentioned time, whilst if a flat dish be employed the plate should either remain under the tap, or should be left for a much longer time and the water changed frequently.

It is well before applying the final solution—that of Schlippe's salt—to look through the plate to see if there is any deposit due to the compound left by imperfect fixation, as it may be removed at this stage, but not afterwards. If there be any such deposit it will, on looking through the plate, show as a creamy-looking patch much resembling the bromide or iodide of silver in a plate which has evidently been only partially fixed. This deposit will generally show most when the plate is looked at through the back by reflected light. That it shows more on the back of the gelatine coating than on the front is due to the fact that the front of the film has been more fully subjected to the influence of the hyposulphite fixing bath than the back. Of course, with proper precautions to ensure complete fixation, such an appearance will not present itself; but if, owing to imperfect fixation, it should be present, the plate must be again immersed in the hypo bath, which for this purpose should be new and strong, until the deposit is completely dissolved. By this time all the intensity will have left the image, and the plate, after washing, must be intensified afresh.

If the plate is clear—*i. e.*, free from the compound referred to as proceeding from incomplete fixation—but it is judged that the intensity has been carried too far, now is the time to reduce it. The reduction may be carried on in a fresh hyposulphite fixing bath to any desired extent, but, of course, after such treatment, the negative must be again well washed before using the Schlippe's salt.

The plate then, well washed, is ready for the final treatment, which consists in the application of a solution of Schlippe's salt. The strength of this solution is, it is stated, not material within reasonable bounds, and so we have found it. Five grains to the ounce of water we have found to be a very convenient strength. The action of this salt is to convert the iodides into compounds which appear to resist further change, and therefore to render the image permanent. It may be judged whether it has produced its full effect by examining the image from the back, and noting whether the change of colour has penetrated entirely through the film. The effect of the Schlippe's salt, as well as to render the image permanent, is to add somewhat to the intensity. If, therefore, it appears that continuing its action to the full will render the negative too dense, it must be washed off rapidly, and if then right, it may be left to thoroughly wash and dry. Although in this case there is not the same reliance to be placed on the permanency of the image as there is when the action of the Schlippe's salt has been allowed to go on to completeness, yet the contact of the deposit which has been acted upon with that which has not, appears to have a considerable protective action upon the latter.

When the Schlippe's salt has been stopped in its action before the whole of the iodide has been converted by it, the latter may, after washing, be dissolved, or partially so, in the new hypo bath before mentioned, and so, by reducing intensity to some extent, another means of regulating this quality to be found.

A final washing completes the process, unless it is deemed that still more density is required, when the entire set of proceedings may be repeated.

ANNUAL EXHIBITION OF THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

The Exhibition will be inaugurated by a conversazione, open to members and their friends at 8 p.m. on Saturday evening, the 1st of October, and the Exhibition will remain open from Monday, the 3rd of October, until Monday, 14th of November.

Medals will be placed at the disposal of the judges for artistic, scientific, and technical excellance, and the judges are instructed to reserve three medals for portrait or figure subjects, one medal for lantern transparencies, and two medals for apparatus (if they find them worthy of awards). The judges will consist of the following:—James Glaisher, William Cobb, William England, W. F. Donkin, F. Hollyer, H. S. Mendelssohn, George Davison; and for apparatus, G. L. Addenbrooke, T. Bolas, James Cadett, H. Trueman Wood.

Regulations.

Each exhibitor of photographic pictures must fill up a printed entry form, and it is suggested that when any work shown is taken by a special process, prepared and made by the exhibitor, information as to particulars should be communicated.

At the back of each frame must be written the name and address of the exhibitor, with the title or description of the picture, and the number (if there be more than one) to which it refers in the entry form.

Each frame or picture may have the exhibitor's name, and the subject of the picture, neatly inscribed, but no address or anything in the shape of an advertisement will be permitted.

Pictures in Oxford frames, and pictures previously exhibited in London, will not be admitted.

Each exhibitor of photographic apparatus must fill up the entry form (supplied by the Society), and write a description of each piece of apparatus, and on the exhibit itself a removable card must be attached, containing the name of the exhibitor, and the number to which it refers in the entry form.

The Exhibition Committee are instructed to refuse apparatus and appliances that have been already shown at London exhibitions and that do not embrace some points of special interest to be mentioned by the exhibitor on the entry form.

Photographs coloured by scientific or mechanical means will be admissible. Photographs coloured by hand will not be admitted. Negatives and transparencies will be admitted.

No charge will be made to members of the Society; but to non-members, a charge of one shilling per square foot will be made for wall space; the minimum charge being five shillings, but no charge for wall space will be made to foreign exhibitors.

Blank entry forms and any further information respecting the exhibition, apparatus, lantern slides, and nomination forms for membership, can be obtained from the Assistant-Secretary, Edwin Cocking, 5a, Pall Mall East, S.W.

THE CONVENTION.

We now give some further particulars as to the Glasgow meeting.

The excursions on Wednesday, July 6th, were favoured with bright sunshine until the middle of the afternoon. One party, under the charge of J. Stuart, went by rail to Balloch, and thence by steamer up Loch Lomond to Tarbert. Walking across a neck of land, Arrochar was now reached; and the return was made by steamer down Loch Long to Helensburgh, whence train was taken to Glasgow.

The second division (leader, Geo. Mason) went on a special steamer to the regatta at Largs, and it is said that 315 plates were exposed.

At the evening meeting Prof. A. S. Herschel (Newcastle-on-Tyne) took the chair, and W. Lang, junr., read a paper on "Carey Lea's Researches on the Photo-Salts of Silver," and he exhibited specimens of those substances which he had himself prepared by following Lea's instructions. In the discussion which followed. J. T. Taylor said that he believed in the possibility of fixing the colours produced by light. Some time ago he had exposed to sunlight for a fortnight a naturally-coloured photograph of the spectrum upon a silver plate, and it was absolutely unchanged. Prof. Herschel said that a similar photograph, presented to his father (Sir John Herschel) by Becquerel, was still in his possession, and was unchanged. He only ventured, however, to examine it by gaslight.

T. N. Armstrong next read a paper on "Photography at Home." As to the necessity for retouching, Mr. Taylor reminded the audience that the Daguerreotypes and collodion positives of former days were untouched, yet they were very pleasing pictures. John Urie thought retouching, as now performed, was a pandering to a vulgar taste; the smooth marble effect being wholly unlike human flesh.

J. J. Briginshaw then gave a lecture on "Polarised Light," illustrated by a large number of beautiful designs in selenite, &c., thrown on the screen by the lime-light. Lantern slides by York, Murray, Armstrong, and Wellington were afterwards shown.

On Thursday a large party were conveyed by the splendid steamer *Columba* to Tarbert and back, a ride of 160 miles. Many groups were taken at Tarbert, including several by J. Stuart on 24 by 20 plates.

At the evening meeting, W. Lang, Junr., was in the chair, and papers were read by W. H. Harrison, A. Pringle, J. T. Taylor, T. Pratt, and A. L. Henderson. Jerome Harrison demonstrated the working of Pumphrey's films and film-holder; and Professor C. H. Bothamley (of Leeds) gave an able account of orthochromatic photography.

In the "business" which followed, the Council were re-elected, with the addition of Messrs. Falconer and Goodwin. A hearty invitation to hold next year's meeting at Birmingham was brought from the local photographic society by Jerome Harrison, who enlarged on the central position of the town, and its close proximity to such interesting spots as Stratford-on-Avon, Warwick, Guy's Cliff, Lichfield, Leamington, Kenilworth, Charmwood Forest, &c. The invitation was unanimously accepted; and it was further resolved that a set of rules for the guidance of the Convention be drawn up and submitted at the Birmingham meeting.

Friday saw the members of the Convention on their way by train to Edinburgh, and in this city they were well received by a deputation of the local photographic society, headed by the president, W. Forgan. Mounting several large brakes, the chief sights were rapidly visited, including the Observatory, the Castle, Holyrood, &c., and then the party drove out to Craigmillar Castle, where luncheon was provided, and where a group (on a 34 by 24 plate) was taken by W. Crooke, as to which plate a telegram "Large group right," was subsequently received at the evening meeting in Glasgow.

Hastening back to Glasgow, W. Lang, junr., presided over the evening meeting, when B. Wollaston read a paper on "Film Photography." The negatives exhibited at the Convention prove Mr. Wollaston to be a master of the art, and we strongly recommend the study of his paper to our readers. In the discussion, W. H. Walker recommended water as the best restrainer; by well soaking the film before development, the absorbed water would act as a restrainer during development. He had entirely given up the use of bromides as restrainers. A. Pringle still preferred ammonia as the alkali. S. McKellen said paper negatives were not exempt from halation, especially if under-exposed. In reply, Mr. Wollaston said he found that with stripping films, ammonia sometimes caused them to be more difficult to get off. He agreed entirely with Mr. Walker's remarks; yet, though water acted as a restrainer when paper was the support, it would not do so with the same emulsion on glass—why, he could not say. He did not believe that halation proper was obtained on paper negatives; the effects seen were rather due to a reversal of the image.

An adjourned discussion upon "Orthochromatic Photography" then followed, in which Prof. Herschel and Messrs. Wellington, Henderson, Parker, and Bothamley took part.

Cordial votes of thanks to the local workers closed the business of the evening.

The council met on Saturday morning at the "Waverley." First the following gentlemen were added to the council:—Prof. Herschel, W. H. Walker, C. Tate, C. H. Bothamley, McDougal, T. N. Armstrong, Dr. Hill-Norris, Councillor Lancaster, J. Place, J. H. Pickard, B. Karleese, Whitlock, John Cillier, and Harold Baker.

A sub-committee of six was appointed to draw up a set of rules for the guidance of the Convention.

Finally, numerous well-deserved votes of thanks were passed.

Reviewing the entire meeting, it must be pronounced to have been, for those who attended, thoroughly enjoyable as an outing. The Convention is as yet the merest infant, without even a code of laws for its guidance. Of the great advantage which a representative annual meeting of photographers may ultimately prove we entertain no doubt; but a point will be, to find means of making the Convention truly representative of photographers in general, and not merely representative of those who can go holiday making for a week. To do this will probably be practicable if the present Council really wish it.

We hope next year to see a large and representative gathering of photographers and photographic experimentalists at Birmingham, and also to see the new institution placed on a proper footing.

Review.

Negative Making. Being a Treatise on the Practical Production of Negatives on Gelatine Plates. By Capt. W. de W. Abney, R.E., F.R.S. Price one shilling. (*London*, 1887: *Piper and Carter*, 5, *Furnival Street.*)

The dry plates are assumed to be ready made, and the hand-book before us deals only with the conversion of the dry plate into a negative.

From the introduction we gather that the subject matter of the articles originally appeared in the *Boy's Own Paper*, and that the author proposes to publish a series of Photographic Primers, of which series the present volume is No. 1.

Excellent advice is given in the chapters on apparatus; and, as regards the lens, the beginner is cautioned against the cheap lenses which so often trouble those commencing photography. He recommends his pupil to go to the makers of reputation, and says, "A very cheap lens is a mistake, for although sometimes a good one may be obtained at a low price, yet, more often than not, such lenses are worthless."

In the remaining chapters one finds lucid directions for arranging the dark-room, exposing, development, and the after treatment of the negative; also an account of the making of paper negatives.

The chapter on failures and remedies is a useful one for reference, and the table of constants at the end will often be found of service.

PICTURE MAKING.

BY DAVID PRATT.*

Much that is written on this subject is without value to the inquiring amateur, because, while it goes round about it, it seldom touches to give practical guidance.

This comes of a general impression that a born artist only knows what elements make a picture, and he who is not thus naturally gifted will only make a picture by chance. It is true that artistic intuition is the power in picture making, and he who is so gifted, when viewing nature, selects by that inborn power what pleases himself and gives pleasure to others. In other words, he is a poet, and when he gives expression he strikes a chord wherever the poetic exists.

This is accepted; but it is not generally admitted that there are also laws in picture-making that may be defined, and the disregard of which makes a pleasurable picture impossible.

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* A communication to the Photographic Convention.

We are told that the old masters had a code of laws which got buried with them, but their works remain to prove the laws they recognized. These laws existed before them, and do exist now, superior to our constituted appreciation of them.

These regulate picture making in each of its branches—landscape, sea-piece, figures in landscape, figures, colour.

If the mention of a few of these laws will start inquiry, this short paper will not be in vain. 1. The chief object away from the centre. 2. The greatest light against the greatest dark, or the reverse. 3. One-third light, and two-thirds dark, or the reverse. 4. The odd set of chords, three or five. 5. If three chords of light or shade be adopted, the one should not be equal to the other. 6. The unequal line or curve of beauty. 7. The odd number of figures. 8. One prominent harmony of colour, or contrast in light or shade.

Let these suffice for the present purpose. A successful picture may be made by the intuitive power although these laws have not been acknowledged, but we maintain fewer mistakes will be made by a full recognition of them.

While chemical and mechanical manipulation is making great strides, and we are seeing beautiful workmanship on every hand by the discovery and recognition of laws regulating these sciences, it only becomes us to formulate the laws of picture making by a careful study of them.

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GELATINE EMULSION.

BY A. L. HENDERSON.*

WHEN I had the honour of reading a short paper at the Convention last year, I mentioned the fact that by the addition of a small quantity of nitrates and bromides to a finished emulsion, much greater rapidity and density could be obtained, and that doubtless further experiments would reveal or explain many things that at present are still inexplicable. I promised that I would at some future occasion detail other experiments. I will now endeavour to redeem this promise.

I think I have stated, that if an emulsion is set and remelted several times, greater speed and a finer quality is the result. My explanation is this : that by the contraction of the gelatine, and the subsequent remelting, the bromide of silver is broken up and altered in crystalline form. Now I know that it will be argued, that if emulsion is kept at a liquid temperature the same result would follow. I have tried the experiment of keeping half of a batch at about eighty per cent. for ten hours. Setting and remelting the other half four times during the ten hours, there was a much greater increase of speed and density in the latter half. Another year's work with the separator corroborates all my previous statements concerning the value of the machine in emulsion making. The full value of the ripening action by the addition of nitrates, &c., to the finished emulsion can only be gained by a complete elimination of the emulsifying gelatine and bye-products. I do not say that the ripening action will not take place in a washed emulsion, but there is an uncertainty about it. The separator has shown me that so long as the temperature of emulsion if kept down, there need be no danger of fog, especially in the presence of caustics; yet, with a large quantity of carbonate of ammonia, an emulsion may be boiled for a considerable time without any fog appearing.

One of my latest dodges is to make an emulsion with carbonate of ammonia separate, add fresh gelatine, nit. potass, and bromide, and then, to prevent decomposition of the gelatine, by addition of a small quantity of chrome alum. I keep this emulsion liquid at a temperature of 98° to 110° for twenty-four hours ; this increases the speed from, say, 16 to 22 on Warnerke's sensitometer. A further prolongation of heat will generally require a fresh addition of chrome alum, when a still higher reading will be obtained ; and, what seems very strange, the camera reading will be much higher than the sensitometer one. I have had two emulsions, both giving 16 Warnerke with a rapid shutter ; and using a stop $\frac{f}{32}$, I had a fully-exposed negative in the one case, and in the other only a faint indication of an exposure. There is a remarkable ripening action by the addition of fresh gelatine, bromide, nitrate, and alum. The method of breaking up of the bromide of silver was first published by Professor Stebbing, and at the time I tried it I found that the effect was obtainable without the bromide, yet I failed to see any advantage. I will now, as an experiment, show you, that by mixing nitrate of silver and bromide potassium in water, then washing the precipitates and adding a few grains of gelatine and applying heat, a remarkable breaking up of the bromide of silver goes on. Of course, as the salts are so perfectly removed, an oxidation or alteration of the bromide is likely to take place when heat is applied : the addition of the nitrates, &c., as aforesaid, tends to prevent this. Some of the gentlemen here may not have seen the action of the centrifugal separator. Messrs. Watson, Laidlaw, and Co. have kindly placed one of their newest forms of machine at my service, with which I will give you a demonstration.

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METRICAL MEASUREMENTS.

BY THOMAS BEDDING.*

I VENTURE to hope that if at this Convention, which at the moment of writing bids fair to be attended by a preponderance of, I will not say professional, but business photographers, some little time is devoted to the consideration of a purely commercial matter, in which our non-practising brethren are as intimately concerned as ourselves, the departure will not be without its advantages, however slight. Harking back for precedents and inspiration to the literature of the Derby meeting, one feels a strong inclination to follow the beaten track instead of prospecting round on one's own account, and it is only the danger of clashing with somebody else that has weighed with me in the choice of so comparatively an out-of-the-way subject. But for these scruples, the exquisite variety of the *debutant* would infallibly have lured me into the fascinating mazes of orthochromatism, or photography in colours, or the recent and continuous opposition to the employment of ammonia in the developer. As it is, I must dissemble, and leave to some one like the President the congenial task of pulverising the natural-colourists, the potentialities of orthochromatism to Mr. Wellington or Mr. Edwards, and the philosophy of development to its own particular guardian angel, Mr. Pringle. As you will have inferred from the title of the paper, I intend going into figures.

Now from figures, on the authority of the right honourable gentleman the Member for Midlothian, you can get very respectable poetry, not perhaps as musical as Robbie's, or as sonorous as Scott's, but still something rhythmical, if only blank verse. I shall not test the truth of this ; I only refer to it in order to quiet those of you who are inclined to be disagreeable because my subject threatens to be so dry. Most of you have, at some time or another, "done" a British Association week, and you must have noticed how sparsely attended has been, for example, the section in which Professor Cayley affably discoursed pure methematics, and how crowded that where Sir John Lubbock airily prattled about ants and other interesting little people. I hope I shall not be treated like poor Professor Cayley, for if you will wait till the end you will find that although I may not have quite realised Mr. Gladstone's enthusiastic belief, you will at least have had plenty of feet and metres, which, as you know, are the very framework of all poetry.

To come to the point : I advocate the adoption of the millimetre, instead of the inch or its fraction, as the unit of all photographic measurements. Of course it sounds revolutionary, this sweeping condemnation of the dear old linear inch, which probably arrived with Julius Cæsar, and equally, of course, the cultivation of the millimetre in its stead must be a dream ; but, gentlemen, all changes are revolutionary, and dreams are the motive-power of progress. The metrical system of measurements is commonly called French, thus leading the unthinking to suppose that it only flourishes in the land of its origin. Nothing of the sort. In every capital from Madrid to Constantinople, from Christiana to Rome, photographic apparatus and plates are made to metrical scale. The system, in fact, is European. The United Kingdom alone holds aloof from it, and adheres to the antediluvian inch, just as it adheres to its own indefensible currency, and many other anachronisms that make people of a progressive turn of mind very angry with her. But we shall have to come to the millimetre some time, just as, by stress of circumstances, we shall be compelled to reform our coinage. Manufacturers are the chief sufferers by the present state of things. For example, the maker of dry plates, following the standard scale of sizes, gets his glass cut to inches, halves, and quarters, and, when ordered, to eighths and sixteenths. He quotes for the chief foreign sizes in his price list, but he only supplies them upon indent, for he has not the courage to stock them. It is different with the French, Belgians, and Germans, some of whom, as you may see from the advertisements, make and stock all their goods in English sizes. Somebody may possibly whisper, "What about Continental tariffs?" I reply, that the superiority of most British goods over foreign ones is so great, that if they were made and stocked in Continental sizes, and systematically pushed, nothing but cent. per cent. *ad valorem* duties would shut them out. Even now, under the present slovenly *régime*, the European sale of some of our products is great, but it might be a hundred times greater. Foreign dealers and photographers desirous of trying our specialities in metrical sizes find that they must wait days, weeks, until they are made—a diversion of which they soon tire. Consequently they patronise native products at a gain of time and a slight loss of quality. Again, suppose a photographer at home wishes to try foreign papers or plates which do not happen to be made in English sizes; his slides and frames will not take them unless adapters and carriers are made, which means a loss of time. From these two illustrations you will see that in consequence of the tenacity with which we cling to the old order of things, commerce and the individual are at an appreciable disadvantage compared with the rest of Europe.

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* A communication to the Photographic Convention.

The permanent change from inches to millimetres would involve no trouble at all to makers of glass, cameras, papers, cards, ebonite, porcelain, frames, &c. Some of them, of course, work to the latter scale at present, but, as I have shown, only intermittently; it is a pity they won't keep to the small unit altogether, for then we should get more accurate measurements than we do now. In regard to dry plates, the two sizes in most common use among us are 4¼ by 3¼, or carte-de-visite, and 6½ by 4¾, or cabinet. On the Continent the two sizes most widely used are 90 mm. by 120 mm., and 130 mm. by 180 mm., which, when reduced to inch measure, are respectively 4¾ by 3½ and 7 by 5⅛, about; in each case a trifle larger than our quarter and half-plates. It would be a simple matter, assuming that we cut our plates by metrical scale, to increase the area of the carte-de-visite and cabinets to these sizes (4¾ by 3½, and 7 by 5⅛)—and, in fact, the same in regard to all the others, of which the 100 by 130, the 120 by 160, the 180 by 240, the 210 by 270, the 240 by 300, the 300 by 400, respectively approximate to our 5 by 4, double quarters, 9 by 7, 10 by 8, 12 by 10, and 15 by 12. Then our foreign clients could have their requirements supplied at a moment's notice, the photographer at home could try and test Continental novelties as easily as he does English ones, and the innocent abroad, in want of a dozen plates, could drop into the Turkish or Spanish dealer's for them, untroubled by any misgivings as to whether English sizes were kept or not. The loss to international trade through our obstinacy must be vast; the inconvenience to professionals and non-professionals alike enormous. The millimetre would remedy all that. I have an idea that a reformed currency would help bring about a change. America has a decimal coinage; let her go a step further and take the metrical system under her wing, and she will be able to swamp the European markets with photographic goods as easily as patent medicines. Some of us, happily, employ the metrical system habitually—gunmakers, to wit, for barrel bores: accuracy in photographic measurements is just as important. A badly cut plate is a common curse, so is an ill-fitting slide; both faults, I believe, may be traced to over-generous marginal allowances.

In suggesting the substitution of the millimetre for the inch and its fraction, I am in effect advocating a total reformation of present sizes; but this sounds more iconoclastic than it really is. Take a metre measure, place it alongside a two-foot rule, and compare the ten or twelve principal Continental sizes with their near equivalents in inches, and you will see that it merely means in some cases a slight increase, in others a small decrease, in our own sizes. The whole matter is innocent of difficulty, and everybody would benefit by the change. The inch is an inchular—I mean insular—prejudice. Some day, when Sir Edward Watkin has tacked Dover on to Calais, and a tunnel connects Scotland with the Emerald Isle, we shall become, to all intents and purposes, a bit of Europe; *then* the metrical system will be forced upon us. We are much in the position of the late Mr. Mahomet: other nations won't adopt our system, so we must adopt theirs if we wish to be in a line with them. By cutting our glass and papers and woodwork to millimetrical scale, we shall have adopted the only philosophical and international system of measurement extant; ensure exactitude, which we rarely get now; save time and make money; and facilitate a better intercourse between antagonistic peoples who, as things look at this moment, are too fond of snarling and quarrelling over much smaller things than even a millimetre. Who knows but that the conversion of this country generally to the metrical system may not be the means of smoothing away the too easily provoked susceptibilities of the Gaul, the Russ, and the Teuton, and of promoting lasting concord between ourselves and our neighbours? I make the Peace Society a Jubilee present of the idea.

I have designedly treated my subject in as light a vein as possible for two reasons: first, because it is possible that the majority of my listeners may be too tired to appreciate a strictly academical treatise; second, because there is no earthly reason why even the heaviest and most dry-as-dust topic should not be approached in an amiable frame of mind.

PRETENDED PHOTOGRAPHY IN NATURAL COLOURS.

BY W. E. DEBENHAM.*

A subject which occurs to me as being one with which the Photographers' Convention may properly deal is that of processes for colouring photographs put forward as discoveries in photography. Every few years such pretensions have been advanced, commonly in connection with some old, abandoned, and re-patented methods of applying paint; but recent occurrences demand, I think, that something more than passing notice should be taken of such pretensions, and the publicity which the proceedings of the Convention enjoy may, I think, properly be used to help to inform the public of the truth in the matter. Not only do photographers suffer in public esteem by their inability to produce nature-coloured photographs, which, by means of bold advertisements and untruthful paragraphs in some even of the leading newspapers, the public have been led to suppose are now accomplished by So-and-So's wonderful discovery, but when the time comes for these false pretensions to be exposed, the public, disgusted with having been taken in, is apt to regard photography itself as being associated with unworthy proceedings.

I was consulted some time since—probably from one to two years ago—by a gentleman who had had some connection with public companies, as to his taking an interest in a process which had been introduced to him as one of photography in natural colours. He sent me the specification (Cellerier's), and when I next saw him I told him what the process was, and gave him my opinion that to bring it out as proposed would be grossly fraudulent. It did not occur to me that anyone possessing any knowledge of photography would suppose that it had any value on its own merits, or that money could be made by it in any other way than by using it as an instrument of obtaining money by a false pretence. Independent of any want of novelty, the conditions of the process—backing up a transparency with a sheet of painted paper—appeared to me to hamper the artist to such an extent, from the difficulty of judging of the effect which his work on a plain tracing would produce when viewed through the transparency in optical contact with it, and from the difficulty in preventing stretching of the tracing and ensuring accuracy of register under the squeegee, that I considered that he would be hopelessly handicapped compared with those who painted photographs either in the usual way or behind the image, as in the Crystoleum and Lambert processes. Indeed, I should not be at all surprised to learn that the Cellerier Company have adopted the latter means—painting direct upon the back of the film—in place of that with which they started.

Of the Cellerier Syndicate I know nothing personally. There may be members or shareholders in it who really believed that they were buying an interest in a process of photography in natural colours. Of course, if they were led to invest money in it under this pretence, a gross fraud has been practised upon them, for which they could, doubtless, obtain redress, if they have not debarred themselves from so doing by consenting to remain partners in such an undertaking after discovering its real character.

After the exposure in the photographic papers of the fictitious character of the Cellerier claim to the title "Photography in Natural Colours," their representative wrote that "the Board gave instructions to withdraw and discontinue any such heading to their processes (Cellerier and Parkes), as they do not wish to adopt any name of a possibly misleading or deceptive character." After this it is disappointing to any one who expected the Board to act up to this profession to find that the title substituted for "Photography in Colours" is "Photographs in Colours," which is very much "such a title," and is certainly misleading. To my mind the only difference in the meaning of the expressions is, that one describes a process, and the other the pictures produced by that process; but both imply that the colours, equally with the drawing, are the work of nature, and not of the hand. On this point, however, as the question has been raised, I should like the opinion of the Convention whether it confirms that which I hold, and which I have found to be that of the public, or not.

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* A communication to the Photographic Convention.

Another process which has been recently announced as photography in colours is that of Mayall. In the *Globe* of May 17, in a paragraph headed, "New Discovery in Photography," it is said that Mr. Mayall "has discovered a means of photographing in colours." "The new camera does its work in colours almost instantaneously, and what rich and delicate colouring it produces!" Now it transpires that Mayall's is a hand-colouring process, and there certainly is no comparison between the credit due to the originator of any colouring process (assuming it to be original) and the honour to which such a discovery as that heralded in the *Globe* would have entitled its inventor. It is, therefore, to be regretted that in a letter of Mr. Mayall's which appeared in the *Globe* a few days later he did not distinctly disclaim the pretensions put forward in his behalf, but wrote in such a manner concerning wave lengths—quite irrelevant in a painting process—as would induce many non-scientific people to believe the claim to be genuine.

The writer in the *Globe* may have been misled by Mr. Mayall's heading: "My New Process for Producing Highly-Finished Coloured Photographs without the Aid of an Artist." A person who applies paint to a photograph is certainly a painter, even if a bad one; and, with regard to colouring photographs, the words painter and artist are used and understood synonymously. If the words "without the aid of a painter" had been used in Mayall's heading, there would have been a direct and obvious misstatement, which some might prefer as bolder to the suggestion implied by the words, "without the aid of an artist." Now, although "artist" is, as has been said, understood with regard to photographic colouring to be synonymous with "painter," it may be said that a photographic colourist must be an artist, even if a very bad one, whilst he exercises the art of colouring photographs; yet he may do them so slightly or so badly that it may be argued that, in one sense, he cannot be called an artist. I have not seen Mr. Mayall's coloured productions, but I understand that a gentleman attending your Convention—Mr. J. Traill Taylor—has an example which is to be shown, and you may be able to judge whether the colourist is entitled, in the sense of ability, to be considered an artist or not.

What is to be said of the conduct of some of the leading newspapers in such matters? If a patch of granite without a grain of noble metal in it is to be offered to the public as a rich auriferous deposit, the papers will not so far lend themselves to the transaction as to call it a great discovery, and speak on their own authority of the purity and abundance of the gold there found. Why should they be so much less scrupulous when photographic matters are in question? Whether there is the smallest justification for the praises that have been lavished upon the beauty of the results of any particular colouring process may be judged by those who have seen them; there certainly is none for absolutely false statements that the colours are the work of nature, and it cannot be supposed that writers who do not scruple to make such statements will hesitate to add flattering descriptions as to beauty, especially as the last-named quality may, after all, be said to exist only in opinion; and a writer might even maintain that he considered that to be beautiful which in the eyes of most people would be considered vulgar, trashy, dingy, false, or gaudy. Are the untrue statements that have appeared due to false information derived from those likely to profit by them, or are they due to the incapacity or venality of the writers? This is a question which it appears to me the proprietors of the newspapers in which such puffs have appeared should, for their own honour and interest, investigate, and to which they should give some sort of reply, at the same time that they insert a withdrawal of the puffs as publicly as they have made them.

It is certainly possible for a journal to guard itself against being made the instrument for propagating untruthful puffs in scientific or pseudo-scientific matters. This is proved by the fact that they cannot, so far as my observation goes, be got into the *Standard*. I don't suppose that this journal is quite alone amongst leading newspapers in being clean-handed in this respect. Perhaps it is in the knowledge of some of the members of the Convention which leading papers have, and which have not, lent themselves to the misstatements referred to. If the present discussion should induce some of the offending or misled journals to make the *amende* suggested, and cause them to be more careful in the future, it will not have been in vain.

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CAREY LEA'S PHOTO-CHLORIDE OF SILVER.

BY WILLIAM LANG, JUNR.

The alchemists of old had their philosopher's stone and elixir of life, and many, indeed, were the attempts made by those early pioneers of chemical science to wrest from nature what they considered would be of untold benefit to mankind. I take it, gentlemen, that if anything in our art is, or can be considered as analogous to the philosopher's stone of the alchemist, we will find it in that branch of photography which has received the name of heliochromy. Photography in natural colours would indeed be a grand achievement, but the question is, Are we any nearer its accomplishment than we were in 1848, when Becquerel laid before the French Academy of Science his silver plate imprinted with the colours of the spectrum. I think, gentlemen, the position of affairs at the moment is this: if silver chloride is to be the medium by which a transcript of the colours as we see them in nature is to be arrived at, we should very soon now be able to say definitely whether the thing be a possibility or not. As you are aware, there have been many workers in this field. It will be sufficient to recal to you the names of Niepce de St. Victor, and of Poitevin, of Herschel, Hunt, and Abney. Becquerel's work we have already alluded to. One would have thought that by this time all the changes that were possible had been rung as far as production of colour from silver chloride was concerned, but that such is not the case is remarkably evident from the contribution to photographic science that has lately been made by Carey Lea. In the May number of the *American Journal of Science*, the first of a series of papers made its appearance, having for its title, "On Red and Purple Chloride, Bromide, and Iodide of Silver—on Heliochromy, and on the Latent Photographic Image," and it is some of the facts brought forward by the American experimentalist, not only in the May, but also in the June number of the *American Journal of Science*, that we purpose laying before the members of the Convention this evening. Carey Lea's memoirs are so full of suggestive material, that in a communication such as the present, one or two points only can be touched upon. Those interested in the chemistry of photography will recognise at once the importance of the researches that have here been carried out. The whole contribution is remarkable for its originality, and it takes its place at once in the first rank of the many classical researches which from time to time have enriched photographic science. Carey Lea's views regarding the latent image may, or may not be, ultimately accepted by those competent to form an opinion; but the fact remains that his experiments will form the starting point for further investigations. It is no small matter for the experimentalist to be able to produce in the laboratory, and in quantity, that coloured form of silver chloride which hitherto has only been obtained, and that in what might be termed infinitesimal quantity, on the surface of silver chloride by the agency of light. To the coloured substance thus produced, Carey Lea has given the name of photochloride, and specimens I beg herewith to put forward for your inspection. It is worthy of notice that this photochloride can be obtained by a great number of methods. For these we must refer those interested to the original paper. It will be sufficient for the present to indicate that particular process by which the specimens now before you have been obtained. Freshly precipitated silver chloride, after washing, was dissolved in ammonia, and to this a solution of ferrous sulphate was added, producing an intensely black precipitate. Dilute sulphuric was afterwards added till a slightly acid reaction was manifest. Thereafter the precipitate was well washed by decantation, and boiled with dilute nitric acid; washing was again resorted to, and the product treated with hydrochloric acid dilute, boiled, and finally washed. I show specimens of the substance both in the moist and dry state. I have also prepared the corresponding photo-salts obtained from the bromide and iodide of silver, thinking that they would not be without interest, and here are the specimens of photoiodide and photobromide in question. Their mode of preparation is somewhat similar to the method employed in the case of photochloride, but here, again, we must refer members for particulars to the original communication reproduced in our own two leading photographic journals.

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* A communication to the Photographic Convention.

To come back to the consideration of the photochloride, the question naturally arises, What is it? Its discoverer describes it as a combination of silver chloride with its own subsalt; but one extraordinary thing connected with it is that no two specimens, although to all intents and purposes prepared in the same way, show the same percentage of subchloride to that of the normal chloride. The amount of the former substance, combined with the latter, seems to vary from half per cent. to something like nine per cent. To quote Carey Lea's own words —"Even when silver chloride, bromide, or iodide contains as little as one-half of one per cent. of subsalt combined, its properties are greatly changed. It has a strong colouration, and its behaviour to light is altered. Even a much less quantity, one inappreciable to analysis, is capable of affecting both the colour and the behaviour to light.

It seems to me that much experimental work will have to be done before a clue to these variations will be satisfactorily obtained. To enumerate all the reactions of this phenomenal compound would simply weary you; one striking characteristic may perhaps be alluded to, and that is its being able to resist for a considerably lengthened period the action of boiling aqua regia. Referring to the colours assumed by this Protean substance, Carey Lea specifies that it "shows all the warm shades from black to white through the following gradations: white, pale flesh colour, pale pink, rose colour, copper colour, red-purple, dark chocolate, black."

Another point that will require eludication before the complete identity of the chloride, coloured by the agency of light, and the photochloride produced in the laboratory, be established, and that is, is oxygen present in the latter substance? Carey Lea says nothing in his memoir that would indicate the presence of oxygen Dr. Hodgkinson's experiments demonstrate what other experimentalists previously had inferred—that in coloured chloride produced by light, oxygen is invariably present. I feel sure we will not have long to wait before an answer will be given to the question here raised.

I think it would be doing Carey Lea great injustice were I not to allude to a discovery he has made, and which is embodied in his memoir—viz., that he is able so to affect a film containing a silver haloid by application of a chemical reagent, that he can produce a result equivalent to the latent image formed by the agency of light. The body which gives this result in the most pronounced manner is sodium hypophosphite. It virtually, according to Carey Lea, converts the haloid into a photo-compound, producing no visible change; but when a developing agent is applied, the action is rendered manifest.

At the conclusion of the article which appeared in the May number of the American journal already referred to, we find Carey Lea making use of the following language:—"I am persuaded that in the reactions which have been here described lies the future of heliochromy, and that in some form or other this beautiful red chloride is destined to lead eventually to the reproduction of natural colours." Now, gentlemen, does this language seem too extravagant? For my own part, I do not think so. The impossibilities of one age become the veriest possibilities of the next. I do not think that even were we able to depict the colours of nature on the photographic tablet, that accomplishment would transcend in value the fact that we are able now, in the merest fraction of a second, to record the most rapidly moving object that can be presented to our cameras. At the commencement of my paper I drew, as it were, a parallel between the alchemist of the past and the photographer of the present. Permit me to continue it; and, should it ultimately be found that a research, such as Carey Lea's, does not lead up to the philosopher's stone of the photographer, does not render possible the reproduction of the colours of nature, still the work he has done will be of lasting value to those interested in the chemistry of the silver haloids. Brewster, many years ago, in his letters on "Natural Magic," wrote as follows, and I think that what he then said regarding alchemy will show that what after all may turn out to be a dream is not without its beneficial result:—"Though the philosopher's stone has not been found, chemistry has derived rich accessions from its search; though the general solvent has not been obtained, yet the diamond and the gems have surrendered to science their adamantine strength; and though the elixir of life has never been distilled, yet other substances have soothed 'the ills that flesh is heir to,' and prolonged in no slight degree the average term of our existence."

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY.[*]

(*Abstract.*)

The subject of orthochromatic photography has latterly attracted considerable attention, and has become of so much importance that a *resumé* of the results which have so far been obtained might not be without interest to the Convention. It is well-known that ordinary photographic pictures have not true "values," that is, do not represent the various coloured objects with their proper degrees of relative brightness. Yellow, orange, and green objects, which are bright to the eye, are almost black in a photograph; whilst blue, purple, and violet, which are comparatively dark to the eye, are practically white in a photograph. The explanation lies in the fact that ordinary photographic plates are very sensitive to blue and violet rays, but are only very slightly affected by green, yellow, and orange rays; whilst the eye is most sensitive to yellow, orange, and green, and is only very slightly sensitive to blue, violet, and red. In order to obtain pictures with true "values," it is therefore necessary to alter the character of the plate in such a way that its sensitiveness to blue and violet is very much diminished, whilst its sensitiveness to yellow, orange, and green is very much increased.

In 1873 Vogel discovered that the addition of certain dyes to collodion plates makes them very sensitive to orange, yellow, and green, and his results were confirmed by other observers. In 1882-3 Attout and Clayton took out a patent in France and England for the application of eosine in conjunction with an alkali to gelatine plates, the word eosine being used inclusively. Dr. Eder, of Vienna, has investigated the effect of a very large number of dyes on gelatine plates, the dyed plates being exposed to the solar spectrum. He found that several dyes slightly diminished the sensitiveness of the plates to blue and violet, whilst they increased the sensitivenesss to green, yellow, or orange, in a marked degree. Only comparatively few dyes, however, exert any useful sensitising effect. Eosine and its allies and cyanin were found to give the best results.

The author has repeated Eder's experiments with the eosine dyes and cyanin, using the spectrum of burning magnesium instead of the solar spectrum.[*] His results confirm generally those of Eder, but he finds that a much greater sensitiveness to yellow, &c., can be conferred upon the plate than was observed in any of Eder's published experiments. Plates treated with an aqueous solution of erythrosine or an ammoniacal solution of rose Bengal are about half as sensitive again to the yellow as to any other part of the spectrum; whilst plates treated with an ammoniacal solution of erythrosine are about two and a-half times as sensitive to yellow as to any other spectral region.

There are two methods of adding the dye to the gelatino-bromide. In one, the dye is added to the melted emulsion, or to the solutions before precipitating; in the other, the dried plates are steeped in an aqueous or ammoniacal solution of the dye. There is at present, a large preponderance of evidence in favour of the latter, or "bath," process, so far as regards the rapidity and orthochromatic effect of the plates.

The particular dye to be used depends on the nature of the effect desired, since different dyes confer a maximum sensitiveness for different rays. The following list may be useful:—Chrysaniline for green; eosine for yellowish green; erythrosine or rose Bengal for yellow; cyanin for orange and orange-red; coerulein S. for red. For general purposes erythrosine, which is closely related to eosine, is the best, since it confers a maximum sensitiveness for yellow, together with considerable sensitiveness for orange and green, especially if used in ammoniacal solution. Of the many articles which are in the market, the author recommends either the "Erythrosine extra" of Meister, Lucius, and Bruning, or the "Erythrosine 1" of the Badische Anilin und Soda Fabrik. The method recommended for preparing the plates differs but slightly from that of Mallman and Scolik, or Eder. The plate employed should be of maximum rapidity, since highly sensitive plates are so near the fogging point that the treatment with ammonia and the dye is very liable to carry them past this point. Paget Prize Plates XXX, or Wratten's ordinary, answer very well. The plates are carefully dusted with a camel-hair brush, and are then soaked for about two minutes in a one per cent. solution of ammonia, drained for a few seconds, and then immersed for about two minutes in the following solution :—

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[*] A Communication to the Photographic Convention.

[*] For details see the *Journal of the Society of Chemical Industry*, June, 1887, pp. 423-433.

Erythrosine solution (1 : 1000)	1 part
Ammonia (1 : 10)	1 „
Water	8 parts

All operations connected with the preparation and development of the plates should be conducted in as weak a light as possible. Yellow light may be used if extreme care is taken to keep the plates covered up; but it is better to use ruby light, such as is given by a candle behind one thickness of ruby glass or paper. Exposed plates are best developed by means of alkaline pyro tolerably well restrained. All the other operations are conducted in the usual way.

Although the application of the dye increases the sensitiveness to yellow, &c., the sensitiveness to blue and violet remains much too great, and in order to obtain correct gradations it is necessary to diminish the intensity of the blue and violet rays by interposing a transparent yellow screen between the object and the lens, or between the lens and the plate. The depth of tint of the screen determines the proportion of blue and violet which is cut off, and hence determines the relative prominence given to yellow, orange, &c. By properly selecting the depth of screen to suit the subject and the result desired, the photographer is able to exercise very considerable control over the character of his picture. The best form of screen consists of a film of dyed collodion, gummed to the diaphragms of the lens. A yellow dye, such as Manchester yellow, or aurantea, is dissolved in enamel collodion to the required depth of tint, and the collodion is poured on a carefully polished glass plate. When dry, the collodion is stripped from the plate and cut into pieces of suitable size. A plate of yellow glass, or of ordinary glass coated with dyed collodion or gelatine, may also be used, and is best cut in the form of a circle and placed inside the hood of the lens—a position in which it does not interfere with the use of cap or shutter. It is essential that the faces of the glass screen be as perfectly parallel as possible, in order that the definition of the lens may not be interfered with.

Treatment with the ammoniacal dye solution increases the rapidity of the plates about three times, but the yellow screen cuts off nearly all the blue and violet, and hence the use of the screen increases the exposure required to twice, thrice, or even ten times that of the undyed plates without a screen, the time depending on the depth of tint of the screen.

In order to illustrate the character of the results obtainable, the author exhibited several sets of photographs of various coloured objects; (1) on an ordinary plate without any screen; (2) on a dyed plate without any screen; (3) on a dyed plate with a yellow screen. The time of exposure was the same in all three cases, and since the plates exposed without a screen were very much over-exposed, every chance was given for the yellow, orange, &c., to register themselves on the plates. Undyed plates exposed for the same length of time behind a yellow screen gave no trace of a developable image. Each plate was developed with a view to obtain the best possible rendering of the yellows, greens, &c. The examples shown included photographs of a scale of coloured paper, chromo-lithographs, flowers, pottery, and landscapes. The "values" of the pictures taken on dyed plates with a yellow screen are very satisfactory, and are an immense improvement on those taken in the ordinary way. In the case of the flowers and pottery the difference was very marked indeed. When the dyed plates are exposed without any screen, the rendering of yellow, green, and orange is very much improved, but blue and violet are far too light. It is only when the yellow screen is used that the values become correct. Care is necessary, however, to avoid cutting off too much of the blue and violet, and thus making the gradations incorrect in the opposite direction. In landscapes the improvement was much greater than was anticipated. It is most marked in the rendering of masses of foliage and of the different shades of green. Moreover, the yellow screen cuts off the greater part of the blue atmospheric haze, and thus gives clearer distances.

Many points of detail require further investigation, but it may safely be said that orthochromatic methods place great additional powers in the hands of the photographer, and constitute a great advance in both scientific and artistic photography.

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Notes.

The Teachers' Photographic Society is a new organisation, under the presidency of the Rev. A. Johnson, headmaster of St. Olave's Grammar School, Southwark, and from the prospectus before us we gather that it is to do the usual work of a photographic association, but with one novel point—"the supply of apparatus on special terms;" and those who wish to learn more about the organisation should write to the secretary, G. A. Freeman, St. Olave's Grammar School, S.E.

The Bristol Camera Society is another new association. The rules seem to be excellent and well thought out, and further particulars will be found on p. 448.

The rules of the Photographic Society of Great Britain, having been found to work inconveniently from time to time, there has been a general desire to have them revised, and, to meet this desire, the council has sent out to members a draft of the proposed new laws, and the whole subject is to be considered at a special general meeting to be held at 5A, Pall Mall East, on Tuesday next, July 19; and it is hoped that every member who can possibly attend will make a point of doing so.

The main suggestions as to alterations have reference to the election of the council, the new proposal being that the whole executive shall retire annually, but be eligible for re-election; but we understand that a considerable proportion of the members are in favour of making every officer who has served for three years in succession, ineligible to serve during the next following year, and they contend that such a rule would prevent any members of the executive becoming, as it were, petrified in their offices. In the meantime members should study the old rules and the new draft.

It is well known that the greater part of the cheap photographic lenses sold in this country under various names are manufactured in Paris, and even the name of the London dealer, who professes to be a maker, is engraved on the mount by the French optician. In America, however, the second-rate dealers have a somewhat different system of selling the French lenses. The glasses are either imported unmounted, or are temporarily mounted as sixpenny microscopes, cheap tin magic lanterns, or other optical toys, the importers by this means managing to avoid paying the somewhat high Customs duties which are charged on photographic instruments; and although the Customs officers have the reputation of being tolerably smart in detecting frauds on the public revenue, they have not—as far as we know—captured any of the consignments thus introduced.

Although the bulk of the cheap French lenses sold under various names in this county and in America are of very indifferent quality, and many are decidedly bad, one may occasionally pick out a very good lens from a batch of them, and the vendors sometimes manage to establish the germ of a reputation on instruments thus picked; but our best opticians have established and maintained their reputation by never sending out a bad instrument, or indeed one which is only moderately good.

Some strikingly successful examples of orthochromatic photography—both with and without the yellow screen—have been submitted to us by E. Senior, of Camberwell New Road. He gives no particulars as to the preparation of the plates.

Buffalo Bill evidently has a high opinion of his coloured portrait, which is plastered on every hoarding in London. There is a society called the Recreative Evening Schools Association, whose mission it appears to be to supply school-rooms with instructive pictures. Col. Cody, it seems, has sent to this Association a number of his coloured posters for use in the drawing classes, an offer which is either made with extreme simplicity, or with a keen appreciation of the value of an advertisement. We would rather not give our opinion on this point, but would suggest, in the interests of truth, that the Colonel of the "Wild West" should also send his photograph. Comparison between the plain picture and the coloured one would furnish an instructive lesson to the children as to how it is possible for art to stray away from nature.

If it be true that before the election of Prince Ferdinand of Saxe Coburg, a large full-face cabinet photograph of the prince was handed round among the Bulgarian deputies, and that there was much scrambling to see it, the whole affair suggests forcibly the advertising phrase which is so common—"Send photo." On the other hand, when you are about to choose a monarch, a little curiosity as to his or her personal appearance is excusable. It is all the more necessary now-a-days, because photographs of royalties are very marketable commodities, and it is too much to expect a nation to rush with avidity and buy portraits of a monarch with a squint, a turn-up nose, or a retreating forehead and chin.

A writer in the *Century Magazine*, having suggested that a good thing for an enterprising photographer to do would be to sally boldly forth and take a cyclone whilst it is, so to speak, on the war-path, has been answered somewhat reproachfully by a journalist, who throws cold water on the suggestion most freely. One of the results of acting on the magazine writer's hint would be, he states, an instant rise in the price of cameras, &c. "A photographer in complete repair," he also opines, "would be a most rare individual." Besides, as he goes on to point out, a cyclone is very peculiar in its way. "It will not use the head-rest"; nor will it "hold its chin a little higher," or assume a pleasing expression. It will not even fix its eyes on the notice, "Terms Cash"; and it is delighted "to catch a photographer with his head under the black cloth." On the whole, the photographer who ventures to tackle the "Wild West" cyclone in its lair is advised to have a special camera built of boiler iron, with steel-plated fittings, and a bank-proof dark-closet! Even then he will be liable to find himself crashing violently through skylights at the moment he should be dropping the shutter; and the suggested drawbacks are, in fact, so numerous, that it is impossible for us to endorse the suggestion of the *Century Magazine.* If, indeed, we might venture to give a piece of advice of our own to American photographers, it would be to be careful not only not to take a cyclone, but to be also equally careful that a cyclone *does not take them.*

Our artist who is a photographer as well may reasonably be expected to know something about the solar spectrum. Any way, he would be sure to learn sufficient to tell him that a rainbow is but a solar spectrum, and that the colours must be arranged in a certain order. As a writer in *Nature* points out, two pictures in the Academy have representations of rainbows which are glaringly wrong in this respect. In one case the artist, discarding the order of red, orange, yellow, green, blue, and violet, has preferred to put the green between the yellow and the red, whether from ignorance, or because he thought it would look prettier, we are unable to say. It is, however, pretty certain that the artist was not a photographer, or he would not have made so absurd a blunder.

Howard Grubb has a valuable article in this month's *Horological Journal* on the choice of instruments for stellar photography, *apropos* of the recent Congress in Paris. This Congress, it may be remembered, has decided to use the refractor, and Mr. Grubb, in discussing the rival merits of the refractor and reflector, is inclined, with Mr. Common, to decide in favour of the latter. He is, however, very judicial in his opinion, and while he does not dispute the fact that very excellent results can be and have been obtained by the refractor, he thinks it would be very unwise to spend large sums of money in the installation of several large refractors over the world without some careful competitive experiments as to the relative fitness of the two systems. He suggests, therefore, that a really fair competitive trial be made between refractors and reflectors to test their fitness before any definite decision be arrived at. This opinion, coming from so high an authority as Mr. Grubb, cannot be lightly set aside, and it is to be hoped that the question will be well weighed, for, as he remarks, it would be unfortunate if money were expended on instruments which afterwards proved not to be the best for the purpose.

HOME PORTRAITURE.

BY T. N. ARMSTRONG.*

When requested to prepare and read a paper on "Home Portraiture," I had considerable doubts as to the desirability of selecting such a subject. At first it occurred to me such could have but little, if any, interest to the majority of our professional brethren. On the other hand, seeing we were to have among us so many amateurs to whom a few practical remarks on what I consider the best means of taking portraits in an ordinary room might be of interest, I deferred to the wishes of those entrusted with our arrangements, and have put together a few remarks which I trust will be acceptable.

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* A communication to the Photographic Convention.

It seems to me by far the larger proportion of amateurs give but little attention to home portraiture, nor is it difficult to find the reason, for of this a very general opinion exists that without the aid of a studio, with its special advantages for lighting, &c., an amateur cannot hope to produce results that will in any way compare with professional work. Now I am not one of those who think thus. On the contrary, I maintain, and hope to be able to show you, that there is no reason why an amateur, in many instances, should not be able to produce really first-rate specimens of portraiture without the aid of a studio.

At the outset, let me say I consider the proper lighting of the sitter of paramount importance, and here it is an amateur who for the first time attempts to take a portrait in an ordinary room is likely to err. In his eagerness to get as much light as possible, the blinds will be run up, the windows scrupulously cleaned, and everything done to flood the sitter with all available light. This using of too much light is one of the first errors a beginner is sure to fall into. If, for instance, we place a sitter near an ordinary window having a good open view, and expose a plate. on developing same it will be found that the contrast from light to shade is too great; the side next the window will be found too light, the off side too dark. What is the reason of this? A beginner will very likely imagine and say, "Oh, it's no use trying, I have not enough light." Now, in reality, such is not the case; it is not that there is an insufficiency of light, but that it is not of the proper quality, or in other words, is not sufficiently diffused.

Now, seeing that diffused light plays such an important part in portraiture, let us briefly consider what is meant by diffused light, and then how best to obtain it.

There are two kinds of diffused light, namely, artificial and natural. The atmosphere being filled with floating particles, all of which being more or less opaque are continually reflecting and absorbing light, those particles that are transparent are constantly refracting and absorbing light, and this constant changing of the course of the rays until they are thrown into every conceivable direction is called natural diffusion. You will readily perceive we have no power of controlling such. But it is not so with artificial diffusion; in portraiture it is a most important factor, and we must bring it to our aid to soften high lights, and break up too strong shadows. But how are we to obtain it? When any translucent screen is made to intercept the direct rays of light, and the atoms of which the screen is composed reflect or refract the rays so that those which come through have lost their general direction, some passing one way, some another, are said to be diffused. This we call artificial diffusion. To obtain such, procure a very thin muslin screen, which place between the window and the sitter, out of range of the lens, in such a manner that all the rays which fall on the face must pass through the gauze. This done, if we expose another plate on our sitter, we will find a very material change has taken place. Not only has the high lights, which were too hard previously, been softened down, so to speak, but the dark side of the face will appear to have been lighted up, thus reducing the violent contrast which previously existed.

Having briefly referred to the necessity of breaking up a too concentrated light, now let us consider the best means of employing a translucent screen so as to throw the light from a proper angle on our sitter.

In making choice of a room for the purpose of taking portraits, choose the one with the tallest windows you can get; the higher the window, the better it will enable you to get more top light. If you succeed in getting a room with a high window, begin by blocking out with a brown curtain three feet of the light at the bottom. This is easily done with an ordinary muslin blind run on a stick, and which can be dyed by steeping it in a decoction of coffee. Then, with another very thin white gauze blind, screen off the light to the middle of the window, and then bring into operation your thin white gauze screen, which rests on the top of the bottom sash, slanting inwards at at angle of about forty-five degrees. Now place your sitter as low as possible, and content yourself with taking a head and bust on a light background. This done, you will not only have your light of the proper quality, but from the best direction; your high lights will not be too hard, nor your shadows too deep. Bear in mind, however, when lighting your sitter, that the shaded side of the face is often very deceptive; the shadows must appear lighter to the eye when posing than they will be in the resulting print. To enable you to light up the shaded side of the face, I know of no better or simpler reflector than the homely clothes-horse, over which is thrown a white sheet. In using a reflector, do not throw the light from behind the cheek, but rather throw the light on the front of the shaded side, allowing the back part of the head to be in the deepest shade.

Lest some of you may imagine that this screening of the light will require unduly long exposure, let me here say that, working with an ordinary cabinet portrait lens, my exposures rarely exceed six seconds when using a rapid dry plate. But some of you may say, "What about facilities for various styles of lighting?" In this we are not even tied down. I have brought with me to-night for your inspection a few examples of my home work, and if you examine them you will find several different styles of lighting. It is wonderful what a variety can be obtained with a little practice, working on the lines I have laid down.

I have spoken first of lighting because, in my opinion, it is the most important of all the many manipulations required in portraiture. Get as much light as you can, but be sure it is of the proper quality; then a little practice will teach the intelligent beginner. It is wonderful how soon he will find out how best to place and light his sitters, so as to obtain proper gradations of high lights, middle tints, and deep shadows. Your chemicals will never give you these if your lighting is wrong; and, beyond everything, do not fall into a practice of under-exposing. Great care must be observed in this. The great point and beauty in portraiture is softness; it is got by properly lighting and fully exposing, and in no other way.

Next in importance to lighting come posing and expression, and here the amateur is not handicapped, but in reality has advantages which his professional brother has not. One advantage which he has, and which is of great importance, is an intimate acquaintance with his sitters; he will most likely know his or her little soft points beforehand, and what little chord to touch and preparation to make so as to put them in the best of humours. I have seen a cup of tea handed to a lady just before sitting work wonders in the way of making her comfortable. Be ever on the watch for even such a trifle as this, and never lose an opportunity of getting your sitter in a natural vein. In posing, the amateur must study, however, and, above all, do not weary your sitters with mauling them about first one way then another. Very likely the first position they will take when sitting down will have something natural about it. Watch for such like a hawk, and if you see they are not going to fall into a natural position, wean them off by drawing their attention to some little triviality, such as letting them walk about a bit, or looking at something pleasing or comical. You are or should not be tied down for time like many a professional; the proper time to be quick is when you have got a good pose and expression. Then be as quick as a needle in a machine if you like. Expression is of the first importance in portraiture. The best hints I ever obtained on posing and expression, I derived from what E. K. Hough wrote, and on this head I cannot do better than quote his own words.

He says:—"We will suppose the sitter to be the centre of a circle with diverging lines, like the hub of a wheel with its radiating spokes; suppose this wheel twenty feet in diameter, and the spokes one foot apart at the periphery. The junction of these spokes with the rim we will call points, like a compass. Now let us place the sitter at the hub, looking straight before him, body, face, and eyes to the camera, ten feet away, at the outer edge of the circle; this we may call a position of neutrality—impassive, inactive. Now, the body remaining in front, the head and eyes turning to the left or right if ever so little, there begins to be expressed activity thought, emotion, in which the eyes play an important part, and a part that may be largely brought under control, else there were no use describing it. To illustrate: if the head be turned two points away from the camera, the body remaining front, the eyes to express an easy, animated, but not deeply interested attention, should be turned nearly to the third point. When the head turns from the body to the fourth point, the eyes to correspond should turn nearly to the sixth, thus expressing the same kind of easy, natural interest, but more active and more interested; and this corresponding divergence amounts nearly to a definite ratio, whether the turning be more or less, being as two to one—two of the head from the body to one of the eyes from the face; or, in other words, in turning the eyes to an easy point, right or left, the head must naturally turn about two-thirds the distance. This ratio of divergence we will call normal, and we shall find it giving about the kind of expression generally preferred in portraiture. Moreover, we shall see that any deviation from this normal relation immediately begins to express something different, often something not at all desired. For instance, the body remaining front, with the face and eyes both turned full upon the third or sixth point, or any intermediate point, there would immediately begin to appear an absorbed, deeply interested gaze, expressing anxiety, surprise, or other emotion, according to the rest of the face and action; while should the face remain fronting, with the body directly toward the camera, with the eyes turned two or three points away, there would immediately appear an uneasy, insincere, jealous, watching expression, not at all pleasant.

"Varying the illustrations by placing the body fronting the third point away from the camera, while the face is turned to the first point, and the eyes into the camera, you will have an easy, direct, sincere, manly attention; while if you place the head and body both pointing to point three, when the eyes are full on the camera, you will obtain at once shyness, coquetry, suspicion, or other similar expressions according to the other facial action; then if you point the body on three, while the face and eyes both turn full on the camera, there would begin to appear a bold, domineering, look-you-out-of-countenance sort of expression, or other similar undesirable effects.

"The same principle holds good in looking upwards; for instance, the head slightly raised, with the eyes about half as much more, may express spiritual contemplation, adoration, supplication, &c., according to the accompaniments; while the face remaining level or slightly drooped, with the eyes still turned upward, looking, as they must, somewhat from under the eyebrows, will express a cowardly shrinking, a sinister watching, or suppressed anger, according to the other features."

These hints might be greatly elaborated, but the intelligent beginner will place his camera before the sitter and multiply these illustrations to any extent. The main thing to thoroughly understand is, that in every modification and turn of position these relations of the eyes to the face will express something, and, if not controlled to express what is desired, may give an expression quite undesirable.

(*To be continued.*)

ELEMENTARY PHOTO-MICROGRAPHY.

BY ANDREW PRINGLE.*

Circumstances over which I have unfortunately no control cause me to prefix to my title the qualifying adjective "elementary." It may appear to many present that in addressing a meeting on this subject at all, I lay myself open to the charge of presumption, for I cannot deny the "soft impeachment" that I am in photo-micrography myself only a tyro, and, in colloquial phrase, a "duffer." But, gentlemen, I have often noticed, and frequently stated, that more is to be learned from the failures of a careful worker, than from the brilliant successes of a natural genius; and it seems certain that a man fresh from the difficulties attending any pursuit is more likely to remember the existence, the causes of, and the cure for these troubles than the man who left them behind years ago, just as it is probable that our sons who left school last year are more conversant with the eccentricities and atrocities of the Greek Particle than we are who have for years directed more immediate attention to the eccentricities of the share market, and the atrocities of the butcher and tax-collector. Anyhow, the very briefness of my experience in photo-micrography must serve as my excuse for addressing you on a matter which may be child's-play to many of you.

Of the utility of photo-micrography there can be little question, and its utility is not by any means confined to the province of the great achievements of "past masters" in the art. I doubt even if the sphere of greatest utility is to be found in the use of the very highest powers upon the minutest and most recondite objects. Moreover, however great the experience and talent of the microscopist, his purse must be as long as his practice and as deep as his knowledge, if he means to travel into the highest realms of the science whose borders I mean to touch. Be this as it may, I have no present intention of travelling beyond the country I know, that is to say, the very first and simplest operation for the production of photo-micrographs.

I will begin by pointing out the subjects that suggest themselves to my mind as presenting only slight difficulties, and yet fraught with vast importance to humanity. I do not think I need point out to a body of photographers—nor, indeed, to any body of reasoning beings—the superiority of a photographic delineation of any object whose qualities depend on its reality rather than its ideality to any delineation that can be made by hand, however deft, guided by eye, however acute. Even the most perfect transcript that could be made with the aid of a camera-lucida must fall immensely short of a transcript by the unerring and invariable action of light. The finest line that ever was drawn by mortal man is a cable in comparison to the lines that may be produced by photography. Now, the very essence of micrographic delineation is clearness and detail, and I submit to you that for clearness and fineness of detail the photographic print must leave far behind all manual dexterity.

What, then, are the objects to which photo-micrography lends itself with the most conspicuous excellence? Undoubtedly such objects as depend for our knowledge of them on their histology, on their most minute markings, on their varying appearances under various kinds and directions of illumination, as, for example, under reflected, transmitted, direct, oblique, and polarised lights. To scientists studying minute organisms, or minute portions of organisms, the greatest difficulty, and yet the moral essential point, is to examine and get delineations of these objects under varying conditions of lighting, and so to become acquainted with the objects that one object can never be mistaken for another, nor one condition for another. In the first place, I will mention physiological and pathological objects—in other words, portions of animal tissue in a normal state, and in a state of disease or abnormality. From experience I can state that many objects of this kind are not difficult to photograph in such a manner that the delineations become of great interest and value for those benefactors of our race—physicians and surgeons. Again, there are many of the lower living organisms whose nature and habits are obscure, though their dimensions are not very minute. There are also vast tribes of diatoms and foraminiferæ whose nature is as interesting as their appearance is beautiful. The geological formations of our earth form a branch of science of the last importance to man, and the study of them with light direct or polarised is one of never-ending interest and variety. The substances which afford nutrition to our bodies and act as counter agents to the waste going on constantly in our life, are, for the most part, amenable to microscopic examination, and, what is more to my purpose, to photographic delineation. Lastly, the germs of disease not only in the animal, but in the lifeless organisms so familiar to us, can be, and have been, and shall be, if we are spared, examined, distinguished, and portrayed by microscopic and photographic agency, till their natures, their habits, their transmission, their reproduction, their annihilation, if it please Providence, shall be a matter not of mystery confined to the *savant*, but understood by all the people. This, gentlemen, is a noble ambition, and the path to its fulfilment is not a dreary, nor a dark, nor a criminal one; the path is illuminated along its course by gleams of highest interest, by intense satisfaction, by a knowledge that the pursuit is glorious and the end philanthropic. The higher flights of photo-micrographic science are surely arduous, beset with enormous difficulties, but we must remember that as we progress the difficulties vanish behind us, and what we now look upon as well-nigh impossible, will in the future, appear pigmy impediments. The very simple operations I propose to mention to this meeting appeared, not so many years ago, to the mass of photographers, as matter of the greatest uncertainty and difficulty, and ought to be fully understood and successfully worked by men who have spent much time in mastering the details of microscopic science.

Having now, at, perhaps, superfluous length, delivered a sort of apology for photo-micrography, I will proceed to practical matters.

The first thing to decide is what kind of objects we mean to tackle, or more particularly, what extent of amplification we mean to attain. My earnest advice is to "ca' canny,"—Anglice, "drive slowly"—at first. Certain failure will follow temerity in this respect. The object for a first trial must be thin, lightly if at all stained; be neither too opaque nor too nearly colourless. The objective should not be a higher power than one inch, while a two or three-inch glass would be preferable. The microscope eyepiece must not be used, as it entails certain difficulties, and in some cases absolute failure.

A word or two about the objective, which is, perhaps, the most important part of the whole apparatus. Micro objectives made for ocular examination of objects, sometimes have their visual and chemical foci not in exact correspondence; a lens of this uncorrected kind is useless for photography. The fault may be remedied in several ways, but my advice is to get a properly corrected lens at first. It may have been De'il's luck attending me, but it so happened that the two-inch, the one-inch, and the quarter-inch with which I started were all faultless in this respect.

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* A communication to the Photographic Convention.

As to the light used. I prefer for simple work a paraffine lamp to other radiants. My start was made with a small cheap lamp of this kind, such as is usually sold with moderate fixed microscopes; my lamp had only a wick of about a quarter-inch wide, but I recommend a wider wick, say one inch, and that I used with its edge turned nearly straight towards the object. A multiplicity of wicks I consider a downright disadvantage; the smaller the area of radiance, commensurate with brightness, the better. I believe an arc electric light to be the best of all, but it is not needed for any such simple work as I am treating of now. An achromatic substage condenser is another valuable aid for advanced work, but for our present purpose an ordinary bull's-eye, called a "stand condenser," is sufficient. This is placed near the light with its flatter side towards the light.

My own first arrangement of camera, tube, object glass, and stage was very convenient for work with low powers, where searching for the object was a matter of ease. I will describe it in a few words, and then pass it, for I found it rather expensive, somewhat awkward at times, useless for really higher power work, and excelled for any work by an arrangement which I shall afterwards explain, and one that finds favour with the best workers both for easy and difficult work. In my arrangement the micro tube, with coarse and fine focussing arrangements, screwed into a cone fitted to the camera front, while the stage with object-clips and a rotating diaphragm with apertures were fixed to the end of the tube by a bayouet joint. By this arrangement the diaphragm, object, objective, and tube were all axially centered on the ground glass centre. But there was no fixed arrangement for centring and keeping central the light and the condensers, and from that fact arose all my first troubles. In our work one of the first necessities is absolute centralisation of the whole of the apparatus; without this, no good can be done. It seems to be impossible to fix all the necessary parts centrally together without involving great difficulty in the operation of finding the object, and the best plan appears to be to divide the whole apparatus into two parts, the components of each part being fixed centrally, and then by means of a "stop" to ensure centralisation of the whole on the longitudinal axis, when the two larger divisions are brought together and aligned by means of the stop. The best arrangement I have seen, and it is approved by good authorities, is one whereby the microscope tube, stage, object, condenser, and light, are all centred on one base-board, while the camera runs axially centred along a short slot on a second base. The microscope base is pivoted on a centre, so as to swing laterally, for a purpose which will soon be explained. The object is first staged and found with the microscope in the usual way, the condenser and light centred on the base carrying microscope, stage, condenser, and light, and then the base carrying all these is swung round to the longitudinal axis of the camera, being arrested there by the fixed step aforesaid. The camera is now pushed forward along the slot aforesaid, so that the end of the microscopic tube projects into the camera, and a light-tight junction is formed by means of black velvet or accurate fitting of the parts.

I know quite well that few of you will understand this very miserable description, and I have no means of offering you a drawing; but I propose to ask our good friends the *press-gang* to publish a drawing of the apparatus as made by a well-known London Firm, Messrs. James Swift and Son. I believe the design is due, to a considerable extent, to Dr. Crookshank, who read at the Photographic Society in June last, a paper on "The Photography of Bacteria;" to describe that paper as "interesting" would be to "damn it with faint praise." Dr. Crookshank may consider himself responsible for an attack of temporary insanity, if not permanent bankruptcy, on my part.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

9693. William Dyke Wilkinson and Frederick Fowler, 216, Bradford Street, Birmingham, Warwickshire, for "An improved photograph frame or holder."—11th July, 1887.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

1068 of 1883. R. H. Brandon, (*Thiébaut.*)—Gelatino-bromide film paper.

1650 of 1883. R. Reynolds and another.—Photographic shutters.

Patent which has become Void through Non-payment of the Sixth Year's Renewal Fee.

1436 of 1881. L. Warnerke.—Photography.

Official Abstract of Accepted Complete Specifications.

Arundel. 11,615, 1886. "Miscellaneous."—Plate-box: hinged flaps at ends fold down to allow the plates to be lifted out.

Cooke (*Francois*). 11,365, 1886. "Cameras (including lenses and lens fittings.)"—Detective: flat disc-shaped box with rotating plate carrier, facilities for changing plates and closing chamber; shutter.

Specifications Published.

6673. Alfred Julius Boult, of 323, High Holborn, in the county of Middlesex, M.I.M.E., for "Improvements in photographic cameras or instruments." (Communicated from abroad by John Robert Connon, of the village of Elora, in the county of Wellington, in the province of Ontario, Canada, photographer.)—Dated 6th May, 1887.

Specification next week.

10,483. Johan Conrad Hösch, of the city of Vienna, in the Empire of Austria, manufacturer, for "A photographic process for printing in colours."—Dated 16th August, 1886.

The patentee says:—

My invention relates to a photographic process for printing in colours, by means of which said process, exact coloured copies of objects of all kinds, such as living objects, oil paintings, aquarells, and other coloured original objects can be produced.

As an example of how my process may be employed, let it be assumed that it is desired to reproduce a water colour painting in six different colours, that is to say, one yellow, one red, one blue, one grey, one flesh, and one intensifying or finishing colour. In such case the process would be as follows:—

A photographic negative would be first taken from the original water-colour drawing, and from this original negative five diapositives, or five glass positive pictures of exactly the same size would be made. These glass positives form the basis of the process of photographic colour printing. I next prepare the glass positives by means of transparent and opaque varnishes, that is to say, I apply the whole, half, and finer tints to such parts as are not to be seen, or only slightly to be seen in each one of the above-named colours for the production of a coloured original picture; I therefore correct the glass positives for each one of my colours; one each for the yellow, red, blue, and flesh colours, and finishing tone.

I now transfer the so-corrected glass positives in the ordinary photographic manner into glass negatives, and retouch the so inversed parts. I cover all the parts, surfaces, and lines, which are reproduced from the negative first taken and not required for the special colour, that is to say, I provide those parts which are transparent with the necessary coverings to such extent as the yellow, red, blue, or flesh colour, and the finishing tone of the original makes it requisite in order to reproduce the colours contained in the said original. I use the first and direct photographic negative for the grey plate as a deepening of the tone for this plate, or the transformation into positive and negative is not necessary. I will then have a plate in which all has been obscured but that which is to print or reproduce the yellow colour, another in which all but that to reproduce the blue has been obscured, and so on throughout the entire plates. When the negatives are used for producing gelatine printing plates, and these plates are printed in the corresponding colours, the six single printings are produced.

I copy these six negatives on gelatine printing plates, and print the sheet yellow by means of the negative provided with yellow colour. This yellow print is now placed in the customary printing press, and printed with flesh colour from the plate provided with this colour.

The sheet so printed with yellow and flesh colours is again printed with the plate provided with red, this sheet provided with the yellow, flesh, and red colours, is again printed with blue from the plate for the said blue colour, and the picture produced with these four colours.

The so prepared sheet is now printed with grey from the negative printing plate containing the grey colour, and then with the tint applied to the last printing plate for intensifying, or finishing the colours, so as to produce the complete picture.

It will be evident from the foregoing that the successive printing of the sheet with the various negative plates, provided with the appropriate colours, will produce an exact copy of the original photograph in the colours of the natural object. Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is :—

The hereinbefore described process for reproducing coloured copies of any desired original, substantially as set forth.

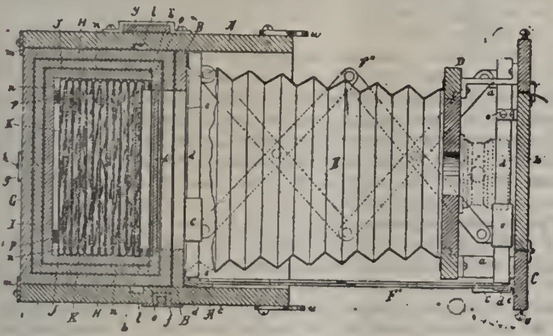
10,411. Fred Barber, Cutlery Manufacturer, 23, Upper Chipping House Road, Sheffield, for "Improvements in dissolving apparatus for optical lanterns."—Dated August 14th, 1886.

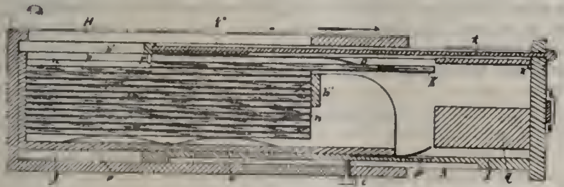
The claim is—The addition to a dissolver for optical lanterns of an auxiliary piece, in which the passages are so formed, and their apertures so controlled, by means of screws or plugs, that it may be used with absolute safety with gases under high pressure, and—

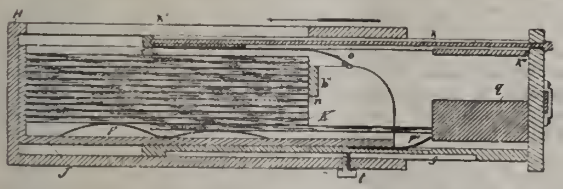
The combination with a dissolver of means for regulating the flow of the gases to all the lanterns in use at one point, and thus obviate the necessity of regulating such flow at each of the burners or jets separately, substantially as herein described.

Patents Granted in America.

363,833. John Loeber, Brooklyn, N.Y., for "Combined photographic camera and plate-holder."—Filed Oct. 25, 1886. Serial No. 217,090. (No model.)







Claim.—1. In a photographhic camera, the combination of an extensible front and a rear compartment adapted to hold a series of plates in a single pile, which can be exposed one after another, the exposed plate being, by devices contained within the said compartment, shifted directly from the top to the bottom of the single pile of plates by the relative movement of the two parts forming the compartment, substantially as described.

2. In a photographic camera, a case carrying a series of plates in a single pile, said case being composed of a main or stationary case and an inner sliding case carrying an exposing-shutter, *k*, the plates being contained in the main or stationary case, and which are to be successively exposed, the said shutter *k* serving to close the front of the inner sliding case when the said inner sliding case is within the main or stationary case, in combination with a camera and lens-cap adapted to close the case to light when the said sliding case is operated to change the front plate to the back of the pile, substantially as described.

3. In combination with a photographic camera, the lazy-tongs movement for projecting in and out and supporting the camera-front, composed of the parts F F′ F″, one series of levers of each separate movement being connected to the sliding sleeves *c c*, which slide on the guides *d d*, substantially as described.

4. In combination with a photographic camera, a plate-shifting device, in which a number of plates are placed, said plates being automatically shifted from the top of the pile to the bottom by devices contained in and operated with a sliding case, substantially as described.

5. In a photographic camera, the combination of a case carrying a series of plates, said case being arranged so that one part is adapted to slide within another, the sliding inner portion serving to withdraw a plate from the top of the pile when moved outward, and shove it under the pile when moved inward, substantially as described.

6. In a photographic camera, the combination of a case containing a series of plates, each plate being within a carrier, said carrier being adapted to engage with spring-catches within the case, so that the movements of the parts of the case will move the plates, substantially as described.

7. In a photographic camera, the combination of a two-part case containing a series of plates and devices within the said case which, when the case is operated, carry the exposed plate from the front to the back of the pile, and a spring adapted to force forward the pile of plates, so that after each operation of the case the plate to be exposed occupies the same position as the previously-exposed plate or plates, substantially as described.

8. In a photographic camera, the combination of a case carrying a series of plates, having an outer portion adapted to be connected to the camera, and an inner sliding portion arranged to be withdrawn when an exposed plate is to be shifted, said sliding portion when drawn out providing a space in which the plate can be shifted from the top of the series to the bottom of the series, substantially as described.

9. In a photographic camera, the combination of a case to hold a series of plates, said case adapted to be arranged to connect with a camera, and means of changing the top plate of the series to the bottom of the series by operating the plate-holding mechanism, and a spring arranged to move the entire series of plates upward, substantially as described.

10. In a plate-holder for cameras, the combination, with an outer and stationary case carrying a series of plates and formed of two parts, both being integral with the other, of a sliding case, said case sliding between the two parts of the outer case, and carrying with it the plate changing and exposing mechanism, substantially as described.

11. A plate-holder for photographic cameras, composed of an inner and outer case of any preferred shape, said outer case being composed of two parts, one part of which is fastened inside, and at one end to the outer case, the combination of these two forming a case wherein the inner case slides, substantially as described.

12. In a photographic camera, the combination of a case containing a series of plates in a single pile, said case being adapted to be attached to a photographic camera, and a sliding case to which a spring-clip and hinged plate are secured for automatically shifting the exposed upper plate of the single pile directly to the back of the pile, substantially as described.

13. In a plate-holder for photographic cameras, the combination of the sliding case I and the hinged plate *r*, carried by the case I, and adapted to engage with the end of the plate-carrier K, substantially as described.

14. In a plate-holder for photographic cameras, the combination of the plate-carrier K, notched as at a'', and the spring-catches *o o*, adapted to engage with the notched carriers and carried by the sliding portion I of the plate-holder, substantially as described.

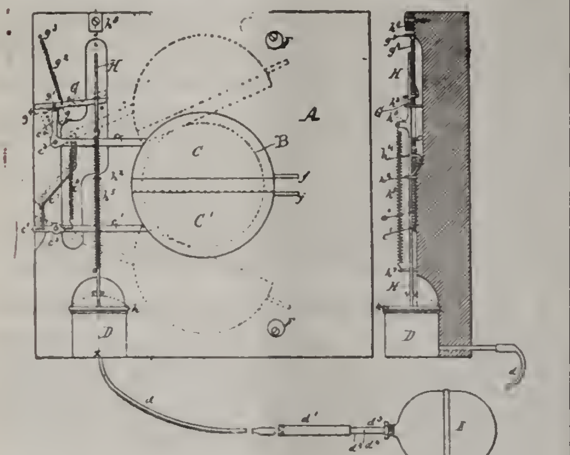
15. In a plate-holder for photographic cameras, the block *q*, adapted to press upon the end of the removed plate and carrier and force the same into position under the pile of plates, in combination with the inner and outer case of the plate-holder, substantially as described.

16. In a photographic camera, a plate-carrier provided with angular indentations a'' a'', formed in its sides for engagement with the shifting mechanism which is carried by the sliding portion of the plate-holder, substantially as described.

17. In a plate-holder for photographic cameras the combina-

tion, with the inner and outer sliding cases H and I, adapted to operate as described, for changing the plates, and a limiting-screw *t*, sliding in the groove *s*, substantially as described.

363,967. William G. Price, New Orleans, La., assignor of one-half to Menard K. Bowen, same place. "Automatically-operating camera-shutter."—Filed Jan. 10th, 1887. Serial No. 223,899. (No model.)



Claim.—1. The combination of the connected arms *c c'*, having the shutters attached to them, pawl c^4, and spring-acted lever G, substantially as and for the purpose described.

2. The combination with camera-shutters and suitable intermediate mechanism of the air-cylinder D, diaphragm *h*, or its equivalent, rod H, having lug h^3, and the spring-acted lever G, substantially as and for the purpose described.

3. The combination with the camera-shutter C C' and suitable intermediate mechanism of the air-cylinder D, diaphragm *h*, rod H, having lug h^4, and the arm *c*, substantially as and for the purpose described.

4. The combination with a suitable camera-shutter of arm *c*, lever G. rod H, having lugs $h^3 h^4$, spring h^5, and air-cylinder D, having elastic diaphragm *h*, or its equivalent, substantially as and for the purpose described.

5. The combination of the air-cylinder D, elastic diaphragm *h*, or its equivalent, and oscillating rod H. with the elastic bumper h^6, substantially as and for the purpose described.

6. The vertically-oscillating camera-shutters C C' having concussion-lugs *f*, and provided with arms *c c'*, pivoted at c^3 c^3, connected by the rod c^7, and the spring c^6, in combination with the elastic bumper F, substantially as and for the purpose described.

7. The combination, with the air-cylinder D, and shutter-operating mechanism, substantially as described, of the tube d^3, having a series of vent-holes, d^4, which can be used either singly or plurally at the will of the operator, the sliding tube *d*, connecting tube *d* and air-compresser E, substantially as and for the purpose described.

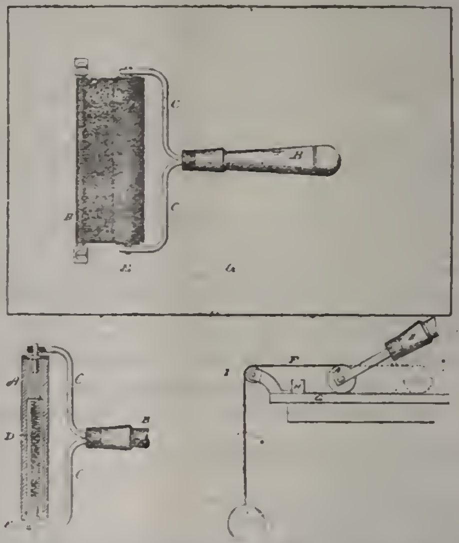
8. In combination with the air-compresser E and tube d^3, having a series of vents, the sliding tube *d'*, having leather lining, d^2, substantially as and for the purpose described.

9. In an automatic pneumatic shutter opener and closer for cameras, an adjustable air-escape device comprising a series of vents, or the equivalent thereof, and suitable mechanism for operating the shutters, whereby the shutters are opened and kept opened for a given length of time and then closed, substantially as and for the purpose described.

364,882. Leo. F. Adt, Waterbury, Conn., for "Rubbing down device for mounting photographs."—Filed Jan. 31, 1887. Serial No. 225,962. (No model.)

Claim. 1. The herein-described device for rubbing down photographs, consisting of a strip of fabric, one end fixed, combined with a roller around which the said strip passes, the said roller adapted to be drawn from or returned to said fixed point, substantially as described, and whereby, as the roller is drawn from the said fixed point, it lays the strip upon the surface below, and on the return of the roller takes the strip from said surface.

2. The combination of a roller, a frame supporting the said roller, but leaving it free for revolution, the said roller made tubular, a helical spring within said roller, one end fixed to the roller, and the other to the axis upon which the roller revolves, a strip of fabric, one end fixed at a stationary point, the other end fixed to the roller, substantially as described, and whereby, as said roller is drawn from said stationary point, the strip will unwind from the roller, and on the return of the roller the strip will be wound upon it.



3. The combination of a handle, a frame fixed to said handle, a roller hung upon an axis in said frame, the said roller made tubular, a helical spring within said roller, one end fixed to the roller and the other to the axis upon which the roller revolves, a strip of fabric, one end fixed to the roller, and the strip wound upon the roller, the other end of the strip fixed upon a stationary point, substantially as described, and whereby by means of said handle, the said roller may be drawn from said stationary point, and unwind the strip, and, returning, the strip will be wound upon the roller.

Correspondence.

THE PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN—THE NEW RULES.

Sir,—Doubtless you are aware that a draft copy of alterations and additions to rules of the Photographic Society of Great Britain, recently formulated by the Council for the more efficient conduct of the Society's affairs, has been circulated among subscribers. Now, when an executive voluntarily initiates reforms much needed and beneficial to the members, without fear of prejudicial consequences that may accrue to themselves, such disinterestedness is certain to be generally appreciated; and I think you will agree with me that the bill the management have to offer is one that, upon the whole, will be welcomed. The Special General Meeting called for Tuesday next, the 19th inst., for consideration by members of the various provisions embodied in the draft, is too near at hand to admit of previous controversy in your columns. May I therefore ask for your indulgence in the matter of space to remark upon one or two points which will give time for the members to consider, before eight p.m. on Tuesday, if they have not already done so.

The present month is, perhaps, the worst time of the year for securing a large attendance of members, but the same date has been chosen before for a similar purpose, with the result of an exceedingly small meeting.

In the new Rule V. it states:—"The Council shall appoint two Honorary Secretaries. The Honorary Secretaries shall attend the meetings of the Society and Council, and take minutes of the proceedings. They shall conduct the correspondence of the Society, and one of them edit the Journal," &c. These gentlemen are to be appointed by the Council from the members of Council, so that, practically, a Council of twenty will have to be elected each year instead of eighteen. I would therefore suggest for consideration the advisability, or otherwise, of acquiescing in that plan, instead of the members nominating two Honorary Secretaries to fill these important posts annually, as they are permitted to do in the case of President, Treasurer, four V.P.'s, and eighteen Councillors.

Then in Rule X. it states:—"Every member of the Society shall be at liberty to nominate one member as President, two as V.P.'s, one as Treasurer, and six as ordinary members of Council," thus limiting a member's nomination to half the number of elected V.P.'s, and one-third of the Counsellors. He may nominate only ten in all, but twenty-six have to be elected. Surely no great harm could happen if a member actually nominated twenty-six men whom he believed to be capable and willing to do the work.

Another point is that of providing against continuity of office (other than President), by making retiring members ineligible to again serve within a year. As the rule now contemplated stands, all officers (other than Hon. Secs. not mentioned) retire annually, but are eligible for re-election; therefore, one of the three following conditions must happen at every election: 1, a house list nomination of the entire officers, much the same as now constituted; 2, an exchange of official posts, as heretofore the custom; 3, an entirely new council, &c., unused to the work.

Neither condition seems desirable. I therefore submit that the old system, which required the retirement of a councillor after three years' service, would, if coupled with ineligibility to fill any other office for one year, exercise a more beneficial influence in promoting the best interests of the Society, than the plan now under consideration of the members.—I am, dear sir, yours faithfully,

W. M. Ashman.

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Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on the 7th inst., F. W. Cox presiding.

The following question was discussed:—"In albumenized paper printing, what are the conditions governing the obtaining of the fullest details in the shadows?"

It was suggested to print only for the shadows by one speaker; another employed ready sensitized paper in a subdued light. Sensitizing with a weak solution, washing the paper, the use of a condensing lens, and masking the thin portions, were all mentioned as being useful under certain circumstances.

W. H. Harrison found weak sensitizing solutions to be more under control in printing, especially when gold salts were used. Prints made by means of the salts of gold gave very pretty colours, and were likely to be stable. Spots in negatives, opaque and transparent, and the best plan of removing them, formed the subject of conversation. Mixtures for spotting prints were also mentioned, but nothing of especial interest transpired.

It was announced that the Photographic Society of Douai is organising an international congress of photographers to be held in Paris during the exhibition of 1889. Enquiry for a means of removing silver stains from negatives was made.

H. E. Moule recommended rubbing with alcohol when the stains were only slight. Another speaker mentioned sulphocyanide of ammonia, as recommended by Robertson some time ago.

The photographic uses of gold size, and the alleged adulterations of "Vaseline," were then discussed, after which photographs of animals formed the subject of an interesting conversation.

J. W. Wharton was elected a member of the Society.

North London Photographic Society.

At the meeting held on July 5, at Myddelton Hall, Islington, N., Alexander Mackie in the chair, N. P. Fox was elected a member.

Among the exhibits was one by J. Jackson, a stereoscopic transparency on a collodio-bromide plate, in toning which with gold it had become stained in the sky of both halves. The effect produced was, however, very pleasing, the appearance being that of a vivid sunset in natural colours.

J. Wills passed round a negative which showed a silver stain caused by contact with albumenised paper while damp. He wished to know if the stain could be removed.

The Chairman said his experience was that the same remedy would not prove efficacious in every case. When the stain was recent, and had not penetrated far into the film, rubbing the spot with a piece of rag moistened with turpentine would sometimes remove it; in other cases he had found a solution of cyanide of potassium useful.

E. Clifton had been successful rubbing with a rag moistened with spirit.

In the course of an interesting discussion on the merits of and objections to shutters of various types, the Chairman said that to be perfect, a shutter should open and close in no time, so that the full amount of light capable of passing through the lens should act on the plate during the whole of the exposure. This was, however, practically an impossibility except in the case of a shutter working close to the plate.

T. Jackson said he had tried many forms of shutter, but preferred the simple drop form, working close to the diaphragm. The shutter he used was of metal, and he regulated the exposure by means of a longer or shorter drop.

L. Churn found that in using Lancaster's rotary shutter there was a jar which caused a blur.

E. Clifton thought the jar occurred in releasing the disc. The spring of the catch was generally too strong. If this were made to work easily, and a firm stand used, he thought the trouble would not occur.

F. Cox having exhibited a platinum print in which clouds were printed in, there was a discussion on printing-in skies and combination printing generally.

E. Clifton said that a method of combination printing, which was particularly useful for printing figures into landscapes or printing landscape backgrounds to figures, had been originally adopted by Mr. Edge, and subsequently by E. Dunmore, with great success. In printing a background to a figure, for instance, the whole of the negative, except the figure, was blocked out, a print from this giving the figure on a white ground. The figure on the print was then painted over with ordinary gamboge water colour, which was allowed to dry. When dry, the print was adjusted to the required position behind the landscape negative and printed in the usual way, those parts covered with the gamboge, being protected from the light, not being acted upon. The print was then fixed in the usual way, the gamboge being gently sponged off in the first washing water.

Edinburgh Photographic Society.

A large excursion party, numbering some fifty-five from the "Photographic Convention of the United Kingdom," meeting at Glasgow, visited Edinburgh on Friday, the 9th inst. The Council of the Society having made arrangements to receive and entertain them, the President and office-bearers, along with the local members of the Convention committee, met the visitors on their arrival and welcomed them to Edinburgh. The whole party then proceeded in large open conveyances, and in accordance with a previously-prepared programme, to visit the principal objects of interest in the city. The weather was exceedingly fine, and all seemed to enjoy themselves. A large number carried the camera, so that quite a brisk series of exposures were made whenever some point of advantage was reached, the Carlton Hill, Holyrood Palace, &c., attracting attention in this respect. But perhaps the most interesting, and certainly the most amusing incident on the route, was the visit paid to the "White Horse Close," one of the oldest localities in the city, and where an ancient hostelry of a most picturesque description exists in the last stages of dilapidation, and bearing on its front the date 1573. The old courtyard was at once crowded, and every camera levelled at the crumbling buildings and stairways, the inhabitants meantime turning out to witness this novel invasion of their quarter. Presently the ragged and shoeless children caught the eye, and all manner of posing and grouping of them began. Someone inaugurated the idea of throwing coppers amongst them in order to get "detective" pictures, which wrinkle succeeded admirably.

From Holyrood Palace, which contains many relics of Queen Mary, the party now drove round the Queen's drive, by Arthur's Seat and Duddingston Loch, to Craigmillar Castle, a ruin picturesquely situated about two miles from town. Here there was a halt made for about two hours, during which time luncheon was served on the green sward. J. T. Taylor, in a short speech, proposed prosperity to the Edinburgh Photographic Society, which he facetiously designated his second child, which was responded to by the president, W. Forgan, who expressed a desire for the complete success of the Convention. Afterwards a group of all present was taken by W. Crooke on a 25-inch plate, which has turned out quite a success

Time now gave warning for departure, and all resumed their places upon the breaks, and the party then drove into town by the meadows, Lothian Road, and George Street, to the Waverley Station, *en route* for Glasgow. The weather was all that could be desired.

SHEFFIELD PHOTOGRAPHIC SOCIETY.

THE ordinary monthly meeting was held in the Masonic Hall, Surrey Street, on July 5th, the President, T. S. YEOMANS, in the chair.

After the confirmation of the minutes, the sub-committee appointed to consider the question of a collection of photos of members to be reduced to a 15 by 12 print, as a presentation print, made their report. Each member was desired to furnish a cabinet print of himself with two-inch head by July 25th. Arrangements were next made for the Society's second excursion to Dovedale via Cromford, on July 12th.

On the question-box being opened a discussion arose on the question, "Do dry plates deteriorate with keeping?" the general opinion being that if plates were well wrapped up, kept free from damp, and in not too high a temperature, no evil effects would ensue. One member expressed an opinion that plates with keeping, slow down.

Seven pictures were exhibited for the monthly competition, "Sunlight and Shadow," John Taylor taking first prize, and T. G. Hibbert, the second. The president's prize for the best picture taken during the Haddon excursion was won by T. G. Hibbert.

PHOTOGRAPHIC SOCIETY OF IRELAND.

THE annual outdoor meeting and excursion took place on June 30, to Lugala and Lough Dan. The day was all that could be desired—the sky cloudless, or nearly so, and not too much breeze, but just enough to moderate the heat. The party drove down to the lake, where cameras were set up and various "bits" taken, everyone seeming to find something to his taste. The party enjoyed a very pleasant day, and exposed 76 plates of all sizes from 12 by 10 to quarters.

BRISTOL CAMERA SOCIETY.

A NEW photographic club for Bristol and neighbourhood has just been successfully started under the name of the "Bristol Camera Society." The Society already numbers some thirty working members, and it is fully expected this number will be largely increased during the next three weeks.

Abel Lewis has been elected President, and Graham Young one of the Vice-Presidents. Henry F. Lewis acts as Treasurer, and F. Holmes and M. Lavington as Hon. Secretaries. The Council is composed of the officers together with Messrs. Appleton, Bryant, Dunscombe, Griffiths, Harris, and Serrington.

It is intended to hold indoor meetings in the winter fortnightly, and in the summer monthly, with occasional excursions. The first outdoor meeting was held on Saturday last, when the members spent an enjoyable afternoon in visiting Henbury, and Blaise Castle and grounds.

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

A. W. W.—The ash of a good quality of paper, sensitized on a sixty-grain bath, will generally contain half its weight of silver, and should be worth about twenty shillings a pound; but the ash of such other items as you mention may contain so little silver as to be scarcely worth extracting. As we cannot even conjecture the proportion of the rich ash to the poor ash in your mixture, a direct answer is impossible. Your best way will be to mix all thoroughly, and reduce an average sample.

LEX.—For general work the equivalent focus of a rectilinear for 5 by 4 plates should be about six inches; but surely you cannot expect us to tell you the focus of some particular lens in your possession unless we see the instrument.

W. HOLDEN.—From the Autotype Company, 74, New Oxford Street.

D. S. J.—Fume your paper with ammonia, and your difficulty will disappear. Your stamps shall be returned if you will send your name and address.

J. B. B.—1. It is published over his name, so we may assume that he wrote it; especially as he has had abundance of time to disclaim having done so. 2. That is a long time ago, and when very different opinions were held. 3. Quite so; but in this case all that can be done is to see that such a grave fault is not repeated, and a non-repetition of the offence must be taken as indicative of repentance.

J. H. CRAMANA.—Hardly the thing; but we will write to you.

M. N. S.—The chloride of gold is the active ingredient, and the acetate is often superfluous. When, however, the chloride contains free hydrochloric acid, the acetate plays an important part, as this free hydrochloric acid becomes replaced by the less active acetic acid, a substance which when present in a small quantity does not interfere with the toning action. The amount of acetate ordinarily recommended is far in excess of the general requirements, and unless the paper is very acid, a fresh addition of acetate will seldom be required; still, there is no objection to adding several times the usual quantity.

MARS.—As far as we know, they are not articles of commerce; but if to be had anywhere, you can get them from Horne and Thornthwaite, of 416, Strand.

NORTH LONDON PHOTOGRAPHIC SOCIETY.—Outing on Saturday, the 16th inst., to Chigwell; train from Liverpool Street, 2.35, to Buckhurst Hill Station.

PHOTOGRAPHIC CLUB.—The subject for discussion on July 20, will be "Toning." Saturday outing at Chislehurst; train from Cannon Street at 2.25.

Photographs Registered.

E. REEVES (Lewes)—3 Photos of Jubilee Celebration at Lewes.
J. HINLEY (Wisbech)—2 Photos of Jubilee Dinner at Wisbech.
JOHN CHAFFIN and SONS (Yeovil)—Photo. of Jubilee Festival at Yeovil.
J. KENNERELL (Wiswech)—Photo. of Jubilee Dinner, Wisbech.
EDWIN DANN and SON (Red Hill)—4 Photos of the Grave of the late John Shaw.
W. J. BYANE (Richmond)—Photo. entitled "Paddling his own Canoe."
W. P. MARSH (Bognor)—3 Photos of Fisherman mending Prawn Pots.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

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IMAGE TRANSFERENCE—A RESEARCH BY CAREY LEA.

In the last number of the *American Journal of Sciences* are some important investigations by Lea, the substance of which is as follows.

By the term image transference I propose to denote certain effects produced on sensitive films, effects curious in themselves, and of interest in connection with the subjects of papers which I have recently written on the photo-salts of silver, &c.

In those investigations it was shown to be possible to take a film of a silver haloid—chloride, bromide, or iodide—and after making marks upon it with sodium hypophosphite, to obtain a development of these marks, precisely as if they had been impressed by light, but quite independently of any exposure to light. I now propose to show that it is possible to develop on a film of silver haloid a complete image—a print from a negative, for example—without either exposing the silver haloid to light, or to the action of hypophosphite, or subjecting it to any treatment whatever, between the moment of its formation and that of its development. The film of silver haloid comes into existence with the image already impressed upon it.

For this purpose almost any silver salt is selected. Citrate, benzoate, tartrate, pyrophosphate, &c., answer perfectly. (Some silver salts, the phosphate especially, undergo a slight reduction spontaneously in the dark; these are less suitable.) A film of the silver salt selected is formed on paper by the ordinary methods, and this is exposed under the negative to a few seconds of sunshine.

The next step is to convert this film into one of silver chloride or bromide by plunging it for a few minutes into dilute acid. Ordinary hydrochloric acid may be diluted with six times commercial hydrobromic, with two or three times its bulk of water; the exact strength is unimportant. After a short immersion the acid is to be washed out, and it only remains to put the film, now consisting of silver haloid, into a ferro-oxalate developer, when the image appears at once. The chloride or bromide of silver into which the salts above mentioned are rapidly converted by the halogen acid comes into existence with the image already impressed on it at the instant of its formation. So that although the substance which received the image is completely broken up and destroyed, the image is not, but is transferred in all its details to the new film of silver haloid.

It is therefore evident that the action of light on all silver salts that can thus transfer an image must be similar in all its essentials to the action of light on the silver haloids. An important conclusion follows: that all such silver salts must be capable of forming sub-salts, else the image could not be transferred. In the case of most silver salts the existence of such sub-salts has not been recognised, or even suspected; indeed, if I am not mistaken, the existence of such a sub-salt of silver phosphate has been expressly denied; but the image formed by light on silver phosphate can be transferred, therefore sub-phosphate must exist. These results have also a very direct bearing on the subject of one of my papers recently published. I there endeavoured to show that the photo-salts of silver as obtained by pure chemical means are identical with the products of the action of light on the silver haloids, both with the material of the latent image, and with the visible product of the continued action of light, or rather with the most characteristic constituent of that product. As respects this latter identity, I showed that although the brightly-coloured photo-chloride could not be obtained by the direct action of light on silver chloride, it could readily be formed indirectly by acting with light on other salts of silver, and treating the product with hydrochloric acid.

It might be argued that in this proof one link was wanting, viz., proof that the photo-chloride obtained by the action of hydrochloric acid on silver salts, other than chloride, exposed to light, was of the same nature as that obtained by the action of light directly on silver chloride. The results above described supply that link, if it was needed, and show that the photo-chloride obtained by the action of hydrochloric acid on silver salts, other than the chloride, exposed to light, has the same capacity for development as has the material of the latent image obtained on ordinary silver chloride.

But this proof itself may be thought liable to an objection. It may be said that as an image was certainly impressed upon the original film, it is not completely proved that the halogen acid had anything to do with the ultimate production of a developed image. The objection would not be well taken, and the experiment may be varied to two ways, either of which eliminates it.

Most silver salts are soluble in nitric acid. After applying the halogen acid it may be washed off, and the paper may be placed in nitric acid until every trace of the original salt (supposing that any escaped the action of the HCl or HBr) is removed, and until it is absolutely certain that nothing is left in the film but the silver haloid. When this is done, the development, so far from being impeded, is rendered only the stronger and brighter. Certainly, therefore, the silver haloid is the essential base of the development.

Another very decisive experiment may be made in this way. Paper prepared with tartrate, oxalate, or almost any other salt of silver, is to be exposed for a minute or thereabouts to a strong light (not under a negative). It is then taken into a dark-room, and marks are made upon it either with a glass rod or a camel's hair pencil dipped in dilute hydrochloric or hydrobromic acid. After letting the acid act for five or ten minutes, it is to be washed off, the paper plunged into nitric acid, and after again washing, it can be placed in a developing solution, when the marks made will appear black on a white ground. This mode of operating gives a very convincing result. The nitric acid treatment may be omitted, but when this is done, the number of salts that can be used is more limited. The four salts first above mentioned give good results, even without the nitric treatment, but some silver salts undergo a spontaneous change in the dark by keeping a short time, such that when they are placed in a developing solution (without exposure to light) they may blacken instantly all over. Silver tartrate is one of the best salts to operate with, though pyrophosphate, citrate, oxalate, and some others do almost equally well. Sulphate, antimonio-tartrate, phosphate, nitrite, and arsenite, do not give good results, except with the nitric acid treatment.

With a salt like tartrate or oxalate the experiment is very striking. The paper imbued with it is exposed to light over its whole surface. It is then taken to the dark room, and simply marked with dilute HCl or HBr, and washed. Thrown into a developer, all the marks of the halogen acid quickly blackens, proving, first, that the effect of light is transferred from the one salt to the other; second, that the effect, as transferred to the chloride or bromide, is far more susceptible of development than it was in the original salt. It seems a not unreasonable explanation of this last-mentioned fact that the greater sensitiveness of the haloid compounds may depend on their power to combine with their own sub-salt, so that the reduction may commence with the sub-salt, and quickly extend from it to the portion of normal salt with which it is combined; that, on the other hand, other silver salts may not share their power of uniting with their sub-salts, and are consequently more slowly and imperfectly attached by the developing solution. This explanation may or may not be correct, but seems not improbable.

A curious fact incidentally presented itself in the course of this investigation: that when paper prepared with silver salts, other than the haloids, was exposed to light, and then marked with HCl, the effect of a short exposure, so far as development was concerned, was as great as that of a long one. A piece of paper was prepared with a given salt by non-actinic light. It was then placed between the leaves of a closed book, with one end projecting. The book was then placed in the light (very faint sunshine), and the prepared paper was gradually drawn out so that different portions received progressive exposures from 400 seconds down to three seconds. A number of marks were made with HCl diluted, parallel to the end of the paper, so that to each mark corresponded a different exposure from three seconds to 400 seconds. The papers were then placed in nitric acid, washed, and developed. These pieces are before me as I write, and it is impossible to say by the appearances which portion received the three seconds, which the 400. The marks are equal in strength on each paper from one end to the other. The salts used were silver benzoate, tungstate, phosphate, pyrophosphate, and tartrate. The short exposure gave a sufficient basis for development; the longer effected nothing more.

The object of this series of papers has been to offer a new explanation of the nature of the latent photographic image, and to show that it consists neither of the normal silver haloid physically modified, nor of a sub-salt, but of a combination of normal salt and sub-salt; that the sub-salt loses in this way its weak resistance to re-agents, and acquires stability, thus corresponding to the great stability of the latent image, which, though a reduction product, shows considerable resistance to even so powerful an oxidizer as nitric acid; further, that this combination of normal salt and sub-salt, which constitutes the material of the latent image, can be obtained by chemical means, and wholly without the aid of light; that the forms of the photo-salts, as I have ventured to name them, which correspond to the material of the latent image, are either colourless or nearly so, but that other forms, possessing beautiful and often intense colouration, also exist. With the chloride, some of these brightly coloured forms show a ready tendency to reproduce colour, in some cases with well marked and beautiful tints. So that we have here an approach to the solution of the problem of obtaining images of objects in their natural colours from a quite new direction, and probably with better hopes of an eventual complete success than by any of the older methods.

PHOTO-ETCHING UPON BOXWOOD BLOCKS.

Some printers believe (as regards the correctness of the belief we offer no opinion) that a boxwood block prints much better than any other substance yet introduced as a typographic printing surface; hence experimenters have endeavoured to produce typographic blocks in this material by photographic agency, and, indeed, with some considerable degree of success.

The following method of working is of Russian origin, and it is equally applicable to line subjects and to tint subjects, provided that in the case of the latter the negative is broken up into a suitable linear or other grain:—The first step is to fill the pores of the boxwood block with insoluble carbonate of copper by means of two separate solutions, in which it is boiled successively; the first solution being strong sulphate of copper, and the second carbonate of soda. It is then soaked in water to remove soluble matter, slowly but thoroughly dried, and a polish is now imparted to its surface; asphalt varnish is applied to its back and sides, and finally a sensitized gelatine film spread over the polished face. To do this the block is adjusted with the face level, and the face is flooded with the following, and allowed to dry in a warm place:—

Gelatine...	2 grammes
Water	16 cubic cents.

Dissolve with warmth, and add—

Ammonium bichromate ...	½ gramme

The block is now exposed under a negative, and, by washing in warm water, the soluble and unprinted parts of the gelatine removed. A coating of asphalt is next applied to the raised parts, and the block steeped in strong nitric acid. The portions unprotected are thus partially changed to nitro-cellulose, which, by brushing, is readily removed in the form of a greenish powder. To complete the process, the block is dried, and briskly brushed with a stiff brush. The asphalt is lastly removed with benzine, and the block is ready for press.

RETROGRESSION IN PHOTOGRAPHY.

We often hear of the advances of photography, and doubtless every scientific discovery in connection with the art, and every improvement introduced into its practice, may be properly spoken of as an advance in photography. Such advances are abiding additions to our stock of knowledge, but sometimes circumstances arise which cause the practice of them to be laid aside for a time, whether or not to be resuscitated depends upon future developments which cannot at present be foreseen. Thus, every improvement in the Daguerreotype process was at the time an advance in photography, but when that process was superseded by collodion, the advances that had been made in Daguerreotypy were of necessity laid aside. So, when collodion in its turn gradually yielded up the field to gelatine emulsion, the improvements which many years of experiment and practice had caused to be introduced into the process of Archer were for the time, at all events, rendered obsolete.

We speak of improvements that have been accomplished in processes that have themselves been superseded, as being laid aside for a time. It is impossible to say of any process which has in the past enjoyed great popularity, that further discoveries may not be made which will bring it once more into favour, and the old improvements may then, or at all events some of them, come into use again, so that one cannot tell of any particular portion of our stock of knowledge, just at present out of actual practical use, that it will not some day be drawn upon to take its useful place in a new development of the process to which it belongs.

When an old process is superseded by a new one, it is not at all a matter of course that the new is in every way better than the one whose place it has taken. Indeed, it may and does happen in photography that there are beauties in a superseded process which are remembered regretfully by some of those who, on account of the greater rapidity or convenience attaching to a new method, find themselves compelled to adopt it in place of an old favourite, some particular beauties of which they cannot succeed in equalling with the process which they have had to take up in its place.

Old Daguerreotypists look back, with an almost affectionate remembrance of the softness of the modelling and the exquisitely delicate definition characteristic of the finer examples of that process, and in this latter particular it has certainly never been equalled, far less excelled. Many practitioners of the gelatine process still think with regret of some particular beauties which they could more easily obtain, when they worked with collodion, than they can now. One of the particular failings often found in gelatine negatives, as compared with collodion, is a want of proportionate registration of strength in the higher lights. It not unfrequently happens, that is to say, that whilst the lights as a whole will come with sufficient force, the highest points of light—which in a perfect photograph lie sparkling upon the lighter half tones proportionate to their brightness in nature—are represented with scarcely any more intensity than the general light surface surrounding them. This state of things was not unknown with wet collodion, although with the process as worked in its later years, it was not commonly present to so great an extent. Where, then, a process has from general advantages superseded another, without in some one point equalling the old one, there is in that one point a retrogression, which it should be our duty to strive to overcome with all the energy and patience which we can bring to the task.

A real cause of want of progress, and even of retrogression, in the practice of photography, is the employment of means more or less artistic to make up for deficiencies, or remedy defects, which would otherwise, by their remaining strongly in evidence, stimulate photographers to find in improved methods a more genuine cure. The use of the retoucher's pencil to put high lights upon the prominent points of the face and of light drapery is a striking instance of this glozing over of defects in place of finding the true remedy by means of more perfect photography itself.

Not only is the progress of photography hindered by the use of artificial means to remedy defects which might or ought to be prevented by a more careful study of the conditions under which these defects come in, and those under which they do not appear, or at all events do not appear so strongly; but the finished result, after all, is far behind what might be accomplished by excellence in photography. We have only to examine the published portraits of celebrities to be seen in the shop windows to see how untrue to nature are the lights often put upon the nose and other prominent features; but most evident of all is the poor rendering of lights upon lace and light drapery, contrasted with what we see in a really sparkling photograph, or in a drawing by a skilful artist. The lines and dots of light generally to be seen on these retouched photographs show palpably that they are not the work of nature, but of a draughtsman, who is so very much her inferior.

A still greater abasement of photography takes place when, as sometimes happens, a photograph is issued which is copied from a worked up print. In such a case the photograph has passed through several stages, in each of which some truth, and some of the beauty of nature, has been lost. In the first place, the original negative has probably been considerably retouched, then the print has been boldly worked upon. Not only in this case are the high lights artificial and unreal, but shadows and lines of black drapery are put in with a heavy, black scratchiness that show at once that they do not owe their origin to nature's drawing. With repeated working up and reproductions, the flesh is apt to become hard and stony, or dingy and smutty in the shadows. Such productions have neither the beautiful, truthful modelling of photography, nor the delicacy and finish of a good engraving, but as they profess to be photographs, and are accepted as such by the unthinking, photography itself cannot fail to suffer in public estimation. No doubt most of our readers have noticed in the windows recently, a royal portrait which illustrates some, at all events, of the defects to which we have referred; and which, indeed, by comparison with the average of what would have passed muster say ten years ago, was the immediate cause of these reflections upon what we hope may be only a passing retrogression in photography.

THE COMIC SIDE OF PHOTOGRAPHY.

BY CHARLES E. PEARCE.*

In looking over the *Fliegende Blatter*, the principal German comic paper, I find that little or no notice was taken of photography as a source of fun before 1860. The humour of the German is peculiar. It is grotesque, has a spice of grimness about it, and occasionally is excessively coarse. Photography, apparently, did not furnish the materials for caricature which the German comic artist found ready to hand in the soldier, the student, the professor, and the Jew.

Almost as soon as the Daguerreotype became popular, the French, with their quick wit, saw what there was of the ridiculous in it, and, as has already been pointed out in previous articles, the caricaturists were never tired of satirising the new art. It was not before 1860, however, when the carte mania was at its height, that the *Fliegende Blatter* woke up to the fact that photography had established itself as a part of our social life. This fact it illustrates by a comparison between the low position occupied by photography in 1850, and the rage which had grown up for it in 1860. "Will you tell me where Dr. Muller the lawyer lives?" asks an inquirer in 1850. "Certainly," is the reply; "go yonder on the right, and you will see the street in which he lives. You cannot make a mistake in the house—it is next to the frames of photographic portraits." The same question asked in 1860 elicits the following answer: "Certainly; go yonder on the right. You cannot mistake the house—it is in the only street where there are no frames of photographic portraits." There is not much in this, nor is the picture representing the outside of a photographer's particularly funny.

The next attempt of the *Fliegende Blatter* is far more amusing, both in the drawing and the joke. It is elaborated in two pictures. In the first a photographer is taking the portrait of an old lady, whose blank look of awe and wonderment is capitally conveyed. "Now," says the photographer, "when I give you the signal, look here in this glass. Now, look!" And the photographer, turning his back with the cap in his hand, and counting his

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* Continued from page 247.

"eins, zwei, drei," &c., is wholly unconscious that the old lady, as shown in the second picture, has walked right up to the camera, and is staring with all her might and main into the lens, from which her nose is almost an inch distant.

The Jew is a standing dish of ridicule for the German comic artist. We have one here with an exaggerated hook nose and bushy whiskers. He is standing posed in a most uncomfortable position, with one leg crossed at right angles to the other, on which he is balancing himself. Photographer: "You have a character in your face which is particularly favourable for photography." Sitter (complacently): "Yes, I am quite aware of it. Which view do you recommend?" Photographer: "Oh, full face for the nose, and a profile for the whiskers." Sitter: "So. Then put my nose in full face and my whiskers in profile!"

"Hold still," says a photographer, in the first of a couple of pictures, to three rustics, who are looking terribly uncomfortable. "Do not move, or you will spoil the portraits. I will not torment you long. One, two three—" but before "three" is uttered, the sitters steal out of the studio for fear of what might happen to them when the cap is taken off the lens. The unconsciousness of the photographer who, with his eyes upon his watch, is totally unaware that his sitters are disappearing, is capitally represented, as also is the expression of relief on the faces of the rustics, who have obviously regretted their temerity in entering a photographic studio.

A picture of "Progress in Photography," showing a photographer on horseback with his head under the focussing-cloth about to take the portrait of a horseman galoping in front of him, is now no longer an extravagance. The aristocratic amateur who takes horse exercise in Rotten Row can, if he pleases, photograph the other equestrians. "My Friends," is a cleverly drawn series of caricatures, representing the average photographic album of the period. There is the "Uncle" of Fraulein Jenny, the owner of the album (of course with the head-rest showing behind his bullet head). "Miss Clara," Fraulein Jenny's most intimate friend, is an English lady of uncertain age, with the orthodox corkscrew ringlets and fang-like teeth. She wears a mushroom hat which throws a sooty shadow over the upper part of her face, in the style seen in hosts of photographs of that day, when too much top light was often used. Herr Meier Lowenstein is an operatic tenor photographed in costume, and standing in an absurdly extravagant pose. Next comes Fraulein Jenny's cousin, a stiff, raw recruit; there is the inevitable scowling child hunched up in an impossible position on a chair; and lastly appears Fraulein Jenny's father, whose foot, stuck in front of him, has been distorted sufficiently to fill up half the picture. The satire in this series is obvious.

Another hit at the Israelites we get in the picture of a Jewish gentleman saying to a photographer: "How much do you charge a dozen for your photographs?" "Four florins the first dozen, and three florins the second." "Oh, then do me half-a-dozen from the *second* dozen."

A very humorous picture is that where a criminal, a sort of Sancho Panza fellow, is being photographed. The stolid cunning and affected innocence are delightfully rendered; only equalled by the haughtiness of the police officer who has him in custody. In the second picture we have the astonished photographer holding up the negative to the light, and discovering that the criminal has put out his tongue in derision, and kept it so during the whole of the exposure unknown to the officer, whose rage and indignation are unbounded. The drawing is full of fun, and shows more care and knowledge than we are accustomed to see in the journalistic work of English artists, whose acquaintance with anatomy is usually very scanty.

(*To be continued.*)

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.*

General Remarks on Bath Processes.—It will be observed that the formulæ given differ mainly in the proportion of dye-stuff which they contain, and that in some instances alcoholic solutions are used, whilst in most cases aqueous solutions are employed. Preference should be given to aqueous solutions, and alcoholic solutions should be avoided as far as possible, since plates prepared with the latter solution are much more liable to show streaks, spots, and similar defects. Care should always be taken that the solutions are perfectly clear, and they should be filtered if necessary, since if the liquid contains any undissolved particles, the latter will settle on the plates and produce spots. After the bathed plates have been allowed to drain, and before they are left to dry, they should be placed for a few seconds with their lower edge on clean blotting-paper in order to remove the ridge of solution which collects along the bottom edge of the plate. Bathed plates must be dried in absolute darkness. A drying-cupboard is not essential, provided that the room is perfectly dark, and each plate may conveniently be supported, face downwards, on two nails driven into the wall in the manner described by Sutcliffe.† Plates treated with an ammoniacal solution of eosin, erythrosin, &c., will keep for several weeks, and can be packed with *papier Joseph* between them like ordinary plates. Plates prepared with cyanin will not keep for longer than a few days.

It has previously been explained that the proportion of dye used is of the greatest importance, and that an excess of dye diminishes both the general and the special sensitiveness. The author has found that when erythrosin is used, both Eder's formula and Mallman and Scolik's formula give plates which seem to be about equally sensitive to yellow, but the plates prepared by the latter formula, which contains a greater proportion of the dye, gave a somewhat better rendering of the green and orange.

It is not advisable, as a rule, to apply any of the ammoniacal baths to the most sensitive plates obtainable. Such plates are usually very near the fogging point, and treatment with the ammoniacal liquids will frequently carry them past this point, rendering it extremely difficult, if not impossible, to obtain clear negatives. The results are better and more certain if plates of medium sensitiveness are selected, and since the ammoniacal baths increase the rapidity of the plates by two or three times, it is evident that after treatment such plates will be quite sensitive enough for all ordinary purposes, even when a yellow screen is employed. The author uses chiefly the plates known respectively as Paget XXX, and Wratten's Ordinary, and obtains equally good results with either brand, though the former are of course considerably more rapid that the latter.

Some difficulty arises from the fact that commercial dyes vary in their sensitising action, and, moreover, the same dye is met with under different names, and different dyes are known by somewhat similar names. Usually dyes are distinguished by their names, such as eosin, erythrosin, rose Bengal, &c., and different shades of the same dye are distinguished by letters or numbers as eosin J, eosin S G F, erythrosin I, erythrosin extra, &c. Generally J or G denotes a yellow shade, B a blue shade of the dye. N commonly denotes a nitro-derivative, and it is advisable to bear in mind that nitro-derivatives are usually very poor sensitisers. The particular letters used to denote a given shade vary with different makers. The Badische Anilin und Soda Fabrik; Meister, Lucius, and Bruning; The Society of Chemical Industry, Basle; L. Casella and Co.; P. Monnet and Co.; A. Poirrier and Co.; and the Actien Gesellschaft Farben Fabrik, Berlin, may be mentioned as the principal manufacturers of coal tar colours. Erythrosin is the most generally useful dye, and the author can recommend the erythrosin I of the Badische Anilin und Soda Fabrik, or the erythrosin extra of Meister, Lucius, and Bruning.

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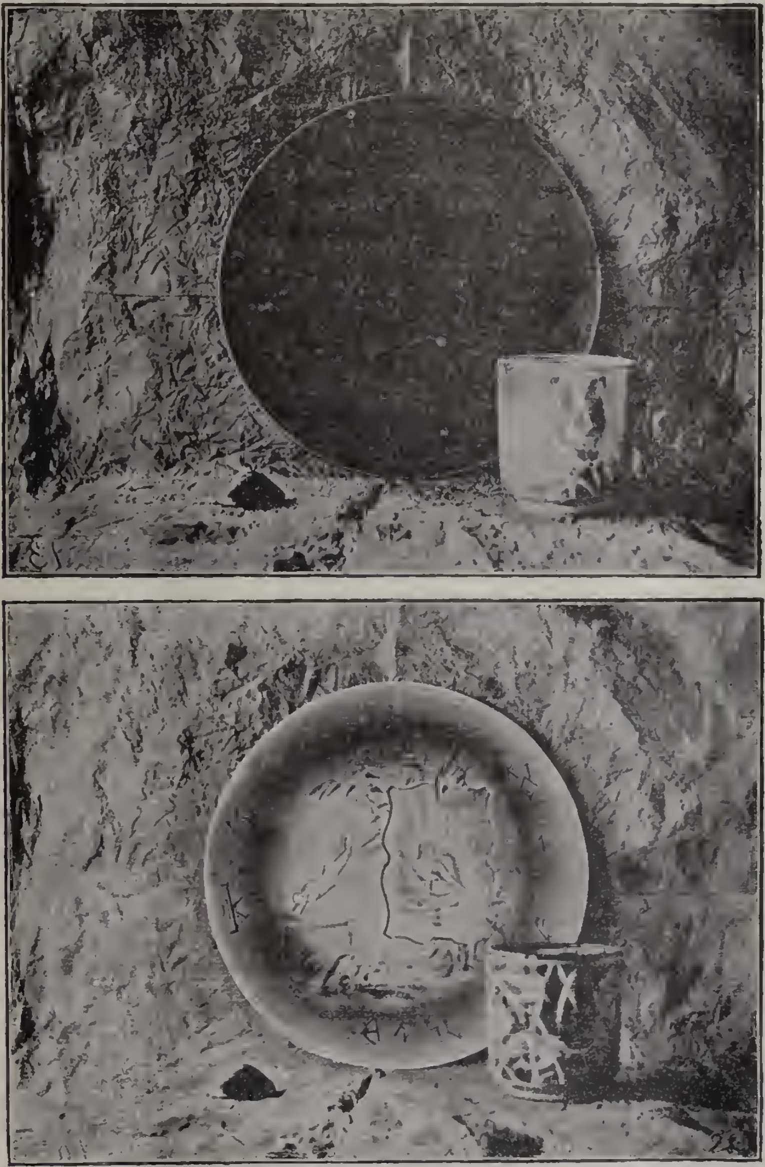
* Continued from page 213.

† Year-Book of Photography, 1883, p. 62.

The Yellow Screen.—Although treatment with dyes by the methods described makes the plates sensitive to yellow, &c., it does not to any great extent diminish the sensitiveness to blue (p. 117), and it is therefore necessary to diminish the intensity of the blue and violet rays by interposing a screen between the object and the sensitive plate Various substances have been used for this purpose. A cell containing a solution of one part of potassium bichromate in a thousand parts of water answers very well, and an aqueous solution of picric acid can also be employed; but the use of a liquid is inconvenient under all circumstances, and is practically impossible in the field. Glass plates coated with dyed collodion or gelatine are most frequently used, but thin plates of yellow or orange glass will answer equally well, provided that the glass is free from air-bubbles and other similar flaws.



Photographs of a yellow and brown plate, and a dark blue and white Japanese vase; A on a Paget xxx plate, B on a Paget xxx plate stained with ammoniacal erythrosin (Mallman and Scolik's formula) with a yellow screen of aurantia collodion. Both plates had the same exposure.

The selection of the proper kind of screen is a matter of the utmost importance, and the power of selection enables the photographer to control his results to an almost unlimited extent. In copying a painting, for example, the screen may be changed several times during an exposure if the lens is capped whilst the change is being made, and thus a shorter or a longer exposure may be given for different colours. By selecting his screens the photographer can, indeed, to a great extent compensate for the fact that the sensitising action of the dye is not equal for the different colours. Exactly what kind of screen or screens to use in each case is a problem which can only be solved by the judgment and experience of the photographer, this judgment and experience being necessarily based on the scientific principles on which orthochromatic photography depends.

An examination, by means of a pocket spectroscope, of the light reflected from different parts of the object will furnish valuable, and in fact almost indispensable, information, which cannot be obtained in any other way, and the same instrument should be used to ascertain the exact nature of any screen which it is proposed to use.

The paler the screen, and the greener its tint, the greater will be the proportion of blue and violet rays which will pass through it; and the deeper the screen, and the more orange its tint, the smaller the proportion of blue which it transmits. It is important to remember that a screen which will stop all the blue rays if the illumination of the object is comparatively weak, may allow a considerable quantity of blue to pass if the illumination is brilliant. It is obvious, too, that the greater the proportion of blue which is cut off, the greater will be the relative strengths of the yellows, greens, and oranges in the negative, and *vice versa.* Care must be taken, however, not to cut off too much blue and violet, otherwise the blues and violets in the object will come out relatively darker than they ought to be. Moreover, many reds, especially red pigments, are not pure, but reflect a certain quantity of blue or violet rays, and thus come out fairly bright on an ordinary plate. If, however, all the blue or violet rays are cut off by a screen, then the red will be relatively much darker, and may be rendered less satisfactorily by an orthochromatic plate with a screen, than by an ordinary plate without any screen. Vogel has recently pointed out that in certain paintings the shadows are more or less blue, whilst the lights of the darker objects, such as the clothing, may also be more or less blue; and it is evident that in such a case, if the blue rays are cut off, the tones of the object will not be truthfully rendered. Further, it frequently happens that the shadows of a landscape towards evening are illuminated mainly by blue rays, and of course the same result would follow as in the case of a painting. If a yellow screen is used, the shadows will come out much too dark.

Collodion dyed with aurantia, one of the coal-tar colours, cuts off most of the blue, the exact amount depending on the depth of tint; gelatine dyed with picric acid transmits a considerable proportion of blue; yellow or orange glass can be selected to cut off any required proportion of the blue rays, if the selection is made with the aid of a pocket spectroscope.

The introduction of a glass plate between the object and the lens after focussing has been accomplished is open to serious objections. If the glass is not very thin, and its faces are not perfectly parallel, the sharpness of the image is disturbed, and of course the introduction of two additional reflecting surfaces is always a disadvantage. Engler has suggested the use of stripped films of dyed collodion, which can be prepared in the following manner. A carefully cleaned glass plate is dusted with talc or French chalk, polished in the usual manner, and coated with plain collodion containing a sufficient quantity of aurantia, or whatever other dye may be selected. It is then allowed to set on a level surface, and when the film is perfectly dry it is stripped from the glass. The stripped film is cut up into pieces of suitable size, which are attached to the lens diaphragms by means of gum. The collodion is so thin that it causes practically no alteration in the sharpness of the image, but there is no difficulty in focussing with the diaphragm in position, unless a very small stop is being used. The films are easily replaced when broken, but their fragile nature is a disadvantage, especially for outdoor work. It is obvious, too, that a duplicate set of diaphragms will be required, if it is also wished to make exposures in the ordinary way. This is, however, the best method that has yet been proposed.

Glass screens answer very well, but it is essential that the faces be perfectly parallel. Either yellow glass, or plain glass coated with dyed collodion or dyed gelatine, may be used as may be most convenient. The glass, which must be free from air-bubbles and other flaws, transparent, and as thin as possible, is cut into the form of a circle just small enough to fit inside the hood of the lens, and is kept in position by means of a ring of brass wire with free ends, which acts as a weak spring. The screen is inserted before focussing, and does not in any way interfere with the use of the cap, shutter, or diaphragms. Moreover, if it is desired to change the screen, or to remove it altogether in order to make an exposure in the ordinary way, the change is effected in a few seconds. When dyed collodion or gelatine is used it is advisable to protect the surface from scratches by means of a coat of varnish, or a very thin cover glass may be used similar to those employed in the preparation of microscopic slides, but, of course, much larger. Ordinary coloured glass not only answers well, but is much less liable to damage than collodion or gelatine films, whether the latter are used on glass or as stripped films.

Such plans as painting the surfaces of the lens with dyed collodion, or inserting a sheet of glass in a hole cut in the cap of the lens, have no advantages over the methods described above, and they have the serious disadvantage that they interfere with the use of the lens, cap, &c., for ordinary purposes.

CARBON PRINTING: EXPLICIT INSTRUCTIONS FOR PROFESSIONAL AND AMATEUR PHOTOGRAPHERS.

BY MAX BOLTE.[*]

Carbon Tissue Paper.—Though it is not very difficult to prepare this paper, as there are so many and reliable manufacturers who produce it in excellent quality, any desirable shade, and at not too high prices, it will be better to take advantage of their products, and save the carbon printer many an inconvenience and failure. I therefore abstain from giving a description how to prepare it, which would moreover lead to a somewhat lengthy discourse. There are, however, some few items which should always be borne in mind:—1st. The fresher the paper the better it will work. 2nd. Always preserve the paper against dampness and emanations from kitchen, stable, or privies; it is almost absolutely necessary to keep it in tin tubes or boxes, which should be as air-tight as possible. 3rd. The cutting of the paper ought to be done with care, and the fingers should not touch the gelatine side, for any such touching would leave a mark, and sometimes show in the picture. During hot weather linen thread gloves should be worn for this manipulation. The operation is often, especially during hot and dry weather, a somewhat tiresome one, since the paper becomes so brittle that it is scarcely manageable. It is therefore good to place it for a night in a cellar or room where some damp clothes are hung up, unroll, but not cut it until sufficiently softened. After cutting, the pieces should be kept under a weight or in a printing frame, and with the carbon sides face to face.[†]

Sensitising the Paper.—The solution should be prepared as follows:—

Bichromate of potash (finely pulverised ...	3 ounces
Carbonate of ammonia	70 grains
Water...	100 ounces

And after complete solution it should be filtered repeatedly through flannel. Never omit the carbonate of ammonia, as it much facilitates development. The solution must be used at a temperature of 58 degrees, and if still cooler it will be better. It should stand at least 1½ inches in the tray, and care must be taken that the temperature does not rise during the sensitising. Having dusted a piece of carbon paper on both sides, immerse it in the solution, carbon side up, and for exactly two minutes, rocking the tray all the time, being careful that the paper remains completely covered. Any air-bells that appear must be removed by the duster. Withdraw the paper and immediately re-immerse in the solution, but this time only for one minute, and carbon side down. Pass the duster over it in all directions, that no air-bells remain adhering to it, which sometimes produce black spots in the lighter parts of the picture.[‡] Having placed a stout glass plate, somewhat larger than the sheet sensitised, on the table, take the sheet, holding it by two opposite corners, and allow the solution to run off; and as soon as drops form, lay it, carbon side down, upon the glass plate, and cover it with the rubber-cloth, glossy side up. Now take the squeegee, and by employing at first a gentle pressure squeegee it in all directions and always from the centre to the edges. The rubber-cloth is now withdrawn, and by means of one or two wood clips the paper is hung up to dry, either on some wires fitted up for this purpose in the drying room, or placed in the drying box. Serve all the sheets to be sensitized in the same way. The squeegeeing of the paper may be omitted if desired, but in hot weather it must be done. The drying is a very important item, for the time which is occupied by it has a material influence upon its after behaviour; if dried too quickly the paper will be found much too brittle, will print slow, and be deficient in half tones: if too long in drying, it will most likely become insoluble and useless. The right time is from six to ten hours. The sensitizing can be done in subdued daylight, or, better still, in the evening, using a sperm candle; but neither kerosene nor gaslight. Carbon paper, when wet, is not affected by light, but once sensitised and dry it is from three to five times more so than albumen silver paper. Proper drying imparts three qualities to the paper:—1st. Vigorous prints, clear whites or high lights, and well-pronounced shadows; 2nd. Easy adherence to the paper, glass, or other transfer medium; 3rd. Easy and short development. Some authors have recommended to sensitise a couple of sheets at the same time, but I have found that this is not to be advocated, as there is no secure way to avoid the air-bells, which, if many sheets were sensitised together, would escape the attention of the worker, but would show when developing, and not easily be removed. It is evident that the sensitising solution, after having used it for a number of sheets, gets weaker, and it is therefore prudent to take a fresh bath after a certain number of sheets, say ten to fifteen, have been immersed. As the bichromate of potash is not an expensive chemical, there should not be a false economy with the bath, and after use the solutions should be thrown into the sink.

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[*] (Continued from page 359)

[†] Single and double transfer paper, also flexible support paper will be described later on, when speaking of their employment for their respective uses.

[‡] The paper first rolls up, but later on flattens out, and this is the right moment to withdraw it from the bath.

Regarding the management of the drying-room and the drying-box, I will here give some hints. The drying room should be as free from dust as possible, and be guarded against any white light, and have a good air supply. The drying-box also must be dry, be well cleaned, and before putting in the paper, the chloride of lime box should be filled about a quarter inch high and the air current established. Should there be much dampness in the air it will be found convenient to employ chloride of calcium, of which a sufficient quantity may be introduced *ad hoc*, and placed in the drying box.* It is good also to remove any vessels containing water or solutions, for their presence in the room would contribute to lengthen the drying of the paper.

Frequently the paper, after a short but good drying, becomes rather brittle and horny; in order to avoid this the sensitising bath may be made up as follows:—

Bichromate of potash	3 ounces
Carbonate of ammonia	70 grains
Water	100 ounces

And for each quart of the solution from one fourth to one-half dram of glycerine, but never more. When working in hot weather it will be found advantageous to add to the preceding formula from 90 to 100 grains of salicylic acid, and it will be found that the reticulation will be avoided.

Having sensitized in the evening, the paper will be found perfectly dry in the morning, provided that everything was all right, and it may now either be exposed to light under the negative, or placed in the preserving or magazine box. Of course, these operations must be performed in non-actinic light. Paper which has been sensitized without the addition of salicylic acid, cannot be kept longer than from three to five days, but those with salicylic acid will keep good, if preserved against the action of the light and air, for as long as ten to fifteen days. It is good to keep the sensitized papers in a light and air-tight box and under pressure.

Negatives.

The negatives which should be employed ought to be of good density, and must be provided with a so-called "safe edge," *i.e.*, some opaque yellow or black paper strips pasted around the borders. These strips ought to be from one-eighth to one-fourth of an inch wide. This is a necessity, for if there were not a safe edge many a good print might be spoiled by a little carelessness, when withdrawing the tissue paper from the transfer medium.

For double transfer the negatives as generally taken are all right, for the picture will show right, *i.e.*, the objects which are on the right side will come in the picture on the right side also; but for the single transfer the negatives must be reversed, for this process gives pictures where the right side objects are shown on the left side. This is due to a peculiarity of the carbon process—the prints must be developed from the back. As it also reproduces in the most absolute way any shades or gradations of the negative, it is necessary when printing from thin negatives that they are covered on the glass side either by mineral paper or matt varnish. The latter is preferable, as it admits that parts which should print strong can be cleared up or scraped off. A very good formula to make the varnish is as follows:—

Gum sandarac (finely powdered)	4 parts
Ether	36 ,,
When dissolved add	
Canada balsam	1 part
Benzole	20 to 30 parts

Filter.

The greater or smaller quantity of benzole produces a coarser or finer grain. This varnish is employed on the back of the negative, which however should not be warmed. If more density is wanted, a second covering with the varnish may be given. The retouching can be done with the pencil, graphite and stump, also with brush and colours, and parts which should print well may be lightened up by means of a brush dipped in mastic varnish. Larger negatives may be covered with mineral paper which was first soaked in water and blotted off. The borders only must be gummed, and the whole sheet drawn as tight as possible over the plate. The retouching, by means of stump and pencil, should be done on the paper when dry. Strong negatives do not require this, but thin negatives will be much improved by it. The single transfer process requires reversed negatives, which may be made either direct in the camera, placing the film side of the plate against the holder (of course the focussing glass should be reversed also, or its thickness taken into consideration when focussing), by means of a prism placed before the lens, or by a mirror inclined 45 degrees to the axial light rays. For these two modes the exposure should be about one-fourth longer. Or reversed negatives by means of film may be used. Negatives of good density turn out powerful, rich prints; thin negatives give flat pictures. By employing weaker or stronger bichromate solutions there is a remedy, and from weak negatives strong and powerful prints may also be made, and *vice versa*. Much-intensified negatives produce hard prints without any soft gradations, and such prints should be exposed, either before or after printing, for a few seconds to diffused daylight.

Photometer.—There are several styles, which all answer well. We shall only speak of two, the scale photometer and the block photometer. The scale photometer can be easily made by any one; it consists of a 4 by 5 glass plate, or smaller, divided into twelve, sixteen, or more squares, and formed by the superposition of pieces of mineral paper, the first square being covered with one piece, the second with two, and so on until the last, which would have twelve or sixteen pieces pasted one over the other.* A 4 by 5 printing frame is very suitable. The silvered paper is laid against the corresponding square, the frame closed and exposed to light, and when sufficiently printed the respective number will stand out white on a brownish ground. The block photometer is a small box provided with a double cover. The upper cover has a round opening cut in it, and under it is placed a glass plate divided into three sections, of which the two outer ones are painted chocolate-brown (the tint which silvered paper shows when exposed to direct sunlight for one and one-half minutes). In the case is placed a roll of sensitised paper corresponding in breadth to that of the inner section of the glass plate, or a little larger, and of any desired length. The end of this roll is drawn over the lower cover of the box so that it stands out a little. The upper cover is now closed and the photometer exposed to the light, and as soon as the silvered paper shows the same colour as the painted sections it is called one tint.

There is now the question how to apply the photometer to the printing. The printing frames having been provided with negatives and sensitised papers, and the photometer having a fresh portion of silvered paper under the opening mentioned, are exposed together to the action of light, and when the photometer shows the required colour, the carbon paper has been acted upon by the light in the same way. How many tints, or what number of the scale photometer, requires a negative of a certain density? This question can only be answered by practice, and the beginner most assuredly will have to sacrifice some prints in order to learn how to estimate the density of the negatives in their relation to that class of photometer which he has adopted. A negative of medium density may require from three to four tints, or even more if matt varnish or some strong retouching has been resorted to. The question which photometer shall be employed should be answered first, for it is prudent to always use the same photometer, as it much facilitates the work when the printer has got well accustomed to its strength. The silvered paper for the photometer should always be of the same strength of silver, for uniformity is absolutely necessary in order to be able to rely upon the right working of all. The silvered paper is best made of Rives paper, immersed for ten minutes in a 10-grain solution of chloride of sodium, and when dry may be kept ready for use. When required, float it for two minutes on a 40-grain solution of nitrate of silver, and add about ten grains citric acid to each ounce of the solution. The sensitizing of course must be done in the dark. The paper preserves its whiteness for weeks when kept from light.—*Anthony's Photographic Bulletin.*

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* From time to time, and especially when the air is humid, some heated bricks should be placed in the drying box, of course before any paper is hung up to dry.

* When all the papers are perfectly dry there should be inscribed the numbers from 1 to 12 (inverted) either with India ink, or some red colour;

Notes.

A negro under sentence of death in Louisville, Kentucky, an American paper informs us, has been charging visitors five cents. each for a look at him, and selling them his photograph. By this means he has been able to indulge in the luxury of a gaudily trimmed coffin and a first-class funeral car.

Some amusement was caused a few days ago at the summer holiday of a large printing establishment held a little way out of town. One of the party was an amateur photographer, and of course brought his camera, much to the indignation implied, if not expressed, of the "regular man." The fact was, the amateur did his work so well, and went about it with such coolness, and in so business-like a way, that his rival took him to be a professional. As the regular man paid the landlord of the tavern where the festival was held £10 a-year for the privilege of photographing his customers, naturally he chafed at seeing his prospect of earning a few shillings slipping away. However, an explanation ensued, and the professional was made happy by having his services called into requisition.

The incident is suggestive. Photography is now so widespread, and apparatus is so cheap, the peripatetic photographer, who used to do a good business with picnicing and boating parties, may perhaps be driven out of the field by amateur competition.

Not long ago we referred to the "Bookbinder" as about to be issued under the editorship of an old photographer, Joseph Cundall. The first number, now before us, contains a useful article on the mounting of photographs as book illustrations, and we propose to reproduce this article next week or some time after. Besides this, we have a good deal of well-illustrated matter to interest the antiquarian and the decorative artist.

Fashion sadly needs the assistance of photography. Du Maurier does his best to illuminate the masses, and through his graphic pencil we get a glimpse of the "ultra" modes of the upper ten; but it is not enough. For instance, one of his drawings in the collection now on view shows us the Chinese method of shaking hands. The operation is performed by loftily elevating the fingers, and then lowering the tips till they point towards the correct dip. But with Du Maurier there is a suspicion that he is laughing at the fashion, and fashion is far too serious a matter in most people's eyes to be thus treated. We would suggest to the fashion journals the propriety of publishing photographs of this and other novelties in manners, so that those outside the charmed circle may follow—although, of course, at a long distance—the leaders of style. Such photographs would, besides, assist in the making of history, and do much towards bringing about purity of taste. Photographs of the "Grecian Bend," and the "Roman Fall," in vogue some seventeen years ago, would effectually prevent a recurrence to this inane affectation in gait.

American apparatus is well spoken of in a paper signed H. P. Robinson, and which paper we reprint (see p. 458) from the American *Photographic Times*, a weekly issued in New York by the Scovill Manufacturing Company.

Special reference is made to the merits of the "Wale" lens, the fame of which has reached the writer, and his eulogium of this instrument formed the subject of an animated discussion at a recent meeting of the London and Provincial Photographic Association. On reference to an advertisement of the Scovill Manufacturing Company (who are agents for the lens), we find that but three sizes of the Wale lens are quoted, the largest having an equivalent focus of only ten inches; but from the context of Mr. Robinson's paper we must assume that larger instruments have been made, and are obtainable.

So far as one can judge from the published prints, the photographs of the procession on Jubilee day are somewhat disappointing. One of the least unsuccessful is that in which the Indian contingent occupies a prominent position; the worst, where the straw hats of the naval brigade are in the foreground, and appear like a series of enormous white soup plates a little indefinite in outline, being out of focus, and completely swamping everything else in the picture. No doubt the photographers were greatly hampered. The difficulty of obtaining a place where a reasonably good view could be obtained must have been very great, and it is a pity that arrangements were not made officially, so that an adequate representation of so historical an event could have been handed down to posterity.

An exhaustive account of the work carried on at the Harvard College Observatory in connection with the Henry

Draper Memorial appears in the *Journal of the Franklin Institute* for this month. It will be recollected that in 1886 Mrs. Draper made a liberal provision for carrying on photographic observations of the stellar spectra as a memorial to her husband. The results have been so satisfactory that Mrs. Draper has decided to extend the original plan of work, and to have it conducted on a scale suited to its importance. Two instruments—an eight-inch Voightlander photographic lens, and Dr. Draper's eleven-inch lens—have been kept at work during the first part of every clear night for several months, and it is now intended that at least three telescopes shall be used. In addition to the instruments named above, Mrs. Draper has decided to present a twenty-eight-inch reflector and its mounting, and a fifteen-inch mirror, which is one of the most perfect reflectors constructed by Dr. Draper, and with which his photograph of the moon was taken. Professor Pickering, the writer of the article, states that photographic apparatus has been furnished to the College on a scale unequalled elsewhere. Mrs. Draper, indeed, has left nothing undone to make the work complete, for she has not only provided the means for keeping the instruments actively employed, but also of reducing the results, and of publishing them in a suitable form. The whole undertaking forms a gift which, in its generosity and the important bearing it is likely to have on stellar photography, is almost unequalled.

It is pretty certain, when photographs of some celebrity are to be seen in every shop window, that there is a genuine interest on the part of the public in the original. What is not quite so certain is, whether the public can be got to take an interest in comparatively unknown persons simply because of the liberal dissemination of their photographs. The French Government is clearly of opinion that it can be done, or it would not have gone to the expense of having the review in Longchamps, last week, photographed, the series including pictures of General Ferron and his staff, which particular photographs are to be reproduced by the thousand, and scattered broadcast over France to turn the tide of the popularity of Boulanger.

The Société Francaise de Photographie is in much the same state as the parent Photographic Society in London: it does not seem to satisfy the requirements of all photographers. A new society, to be called the "Association Parisienne de Photographie," is talked of, and has got so far as to publish the rules of its constitution. It proposes to meet fortnightly, to give medals for good work or discoveries, to establish a studio and laboratory for the practical study of photography, and to form a library. The *Moniteur de Photographie* discountenances the project, and asks whether the idea emanates from any of the three hundred members of the existing Society, or whether it comes from outsiders. The *Moniteur* admits the existence of a section of the Society who are disposed to think there is a certain immobility and tendency to inaction in the old Society, but adds that when the committee is appointed, the same men are invariably elected, "which is a certain proof that their administration is satisfactory." The *Moniteur* goes on to say that if any member will point out at the monthly assemblies what can be done better than has been done, the matter will be discussed, and if the majority are of opinion that more activity might be shown, and more money spent, then the committee of administration will execute their desires. All this sounds remarkably well, and if it be the fact, it is certain that the French Society has more elasticity than the English one. Not very long since a member of the latter complained that when they (the members) tried to discuss their own affairs they were sat upon. We presume, however, that the meeting this week is a proof of the contrary.

COLOURED CHLORIDE OF SILVER.

BY W. H. HARRISON.*

From time to time, in most civilized countries, and not always in the great gooseberry and sea-serpent season, the daily newspapers announce to their readers the discovery at last of the means of taking photographs in natural colours. In such cases investigation always proves that the venders of such photographs are taking them by known methods, and afterwards colouring them by hand. These commercial ventures have nothing to do with true heliochromy, the first recorded experiment in which was performed by Seebeck, of Jena, in 1810. The subject was in later years studied and brought to a moderately advanced state of perfection by Becquerel, Poitevin, and Saint-Florent. Sir John Herschel observed some of the phenomena of photography in colours, but did not follow them up; and Niépce de St. Victor—nephew of Nicéphore Niépce, one of the fathers of the photographic art-science—produced some of the best photographs in natural colours which have yet been seen. For the most part, however, he merely made use of Becquerel's discoveries, and in this matter was shining chiefly by reflected light, as I have recently become aware while reading up the original memoirs in the history of this subject. Silver plates for this class of work have given the best pictorial heliochromic results, those on paper not being so true to nature after the partial fixing of the proofs. A chief difficulty always has been the fixing of these pictures; some of them will resist the action of daylight for a few weeks or months, but those who produced them say that they will fade at last. They are products of scientific, and not of commercial, interest.

Quite recently Mr. Carey Lea, of Philadelphia, who has been indefatigable in original experimental photographic research, has succeeded in producing red or violet chloride of silver in bulk, and it is possibly the same substance upon which heliochromic results have been obtained by early experimentalists; hence, as the record came under my notice while reading archaic documents for other purposes, I thought it might be well to translate and forward to the present Photographic Convention at Glasgow what Becquerel thought of the coloured chloride of silver upon which he obtained his photographs in natural colours.

In vol. xxii. of the *Annales de Chimie et Physique*, Paris, 1848, Becquerel says:—

"I think that the compound formed on the metallic silver under the action of chlorine is a special chloride, perhaps a violet subchloride, or a mixture of white chloride and subchloride."

In the *Annales de Chimie et Physique*, vol. xxv., 1849, he says:—

"If freshly precipitated white chloride of silver is taken, well washed in obscurity, then extended upon ground-glass or paper, and a portion of it covered with an opaque screen, while the other part is exposed to a feeble light, when the solar spectrum is afterwards thrown upon the surface, so that half of it falls upon the exposed, and the other half upon the unexposed part, the action of the spectrum upon both can be observed simultaneously. After the lapse of a little time, and with diffused light eliminated, under the blue and violet rays both the chlorised sections are alike coloured violet; from the red almost to the blue no effect is produced upon the white chloride in less than about half an hour, while on the pre-exposed chloride the red rays give a slight rose tint, and the green rays a green tint.

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* A communication to the Photographic Convention.

If, instead of using well washed chloride, photographic paper with free nitrate of silver is employed, the effects are complicated, and the colours entirely masked. The effects of continuation between the blue and red, which I described several years ago, can then be observed. . . . . Among the solutions which destroy the colours of photo-chromatic images, and which dissolve and decompose chloride and subchloride of silver, and precipitate metallic silver, the most active is liquid ammonia. When a coloured proof of the spectrum is washed with this, the spectrum appears as a greyish band upon the brown ground of the plate. But if this band is examined with attention while the film is still wet, it is seen that the extremity which was red before the washing has now a slight green tint, whilst the previously violet extremity is now blue; these tints are complementary to the first; when the plate dries, the effect disappears.

Mr. Carey Lea seems to me to have been making chloride of silver reduced in small part to a coloured mixture which curiously resists the solvent action of nitric acid; the heliochromic films are likewise partially reduced, but by exposure to diffused light or prolonged heat before they are used to photograph colours. When, however, one has haloid salts decomposed to such an extent as to be coloured red or violet, I do not yet see what that has to do with the nature of the latent image, in which there is no evidence either to eyesight or to chemical tests that such coloured salts have been formed. That an image should develop where a sensitive plate has been marked with hypophosphite of soda, perhaps merely means that the developer has a more intense action there, as from its composition one would expect hypophosphite of soda to be a developer; it is not so, however, at normal temperatures. That a weak solution of it should have a retarding influence may be regarded as a curious unexplained fact. Supposing that the method had been continued until the water used to mark the film contained no hypophosphite of soda at all, and supposing a developer were then applied to the film before it was absolutely dry, would not with most plates the silver deposit upon the damp parts then be lighter than upon the rest of the plate? Mr. Carey Lea's utterances about the red haloid salts do not seem to be yet finished, and these critical comments are made chiefly with a desire for additional information. I am very glad to see his contributions once more in photographic literature.

As in most original discoveries, at first it is impossible to see the future practical value of Carey Lea's interesting revelations, nor does the true man of science care for future practical issues when laying bare to the world a new truth about the phenomena of nature. In this instance chemical methods of producing heliochromic chloride of silver in bulk seem to have been discovered, consequently if Carey Lea would tell us how attempted pictures in natural colours produced upon it compare in point of accurate rendering of hues with those obtained by Edmond Becquerel, Poitevin, and Saint-Florent, an interesting point would be cleared up. The discoverer is able to select the sample of red chloride which gives the best results, because of his antecedent experience; the reader who wishes to try for himself does not know by which of the numerous methods of preparing the new chloride he is likely to get the best promise of good heliochromic results.

This coloured chloride will probably help to give a true theory of full printing upon ordinary albumenised paper, but where is its link of connection with the nature of the latent image? How do its properties explain the experiments of Dr. Janssen, of Paris, who obtained three or four reversals of the invisible image successively upon the same film? How do its properties explain Mr. Carey Lea's own noted experiment of the past, of the image upon pure iodide of silver dying out again and again during a rest in darkness, and afterwards leaving the plate ready each time for a fresh impression? The two last questions I have several times put straight to the advocates of the chemical hypothesis of the latent image, and have never been able to obtain a straight answer.

We hear much talk about suboxide and subchloride of silver, but nobody has yet been able to produce a sample of either which chemists as a body will admit to be such. Dr. Hodgkinson does not believe that his production is subchloride of silver, but a salt containing oxygen; possibly it is the same chloride that Mr. Lea has manufactured.

There will perhaps be some difficulty in getting behind the dynamic hypothesis of the latent image, first launched upon the world by the late Mr. Mungo Ponton and myself, which is, that the invisible picture is due to modifications of the relative motions of the atom of chlorine and the atom of silver, so that at one portion of the new vibratory swing set up by light their attractions are so weakened that the chlorine can be seized by the developer. This hypothesis readily accounts for the re-sensitizing in darkness of an exposed film of pure iodide of silver, and is the only hypothesis which as yet has in any way been used to explain Dr. Janssen's experiment. It also explains why some parts of the spectrum act more than others upon sensitive salts.

On bromide of silver suspended in gelatine, the latent image may last for months, or in some cases, perhaps, for years; but analogies of the same nature may be found in the realm of physics.

Some samples of powdered fluor spar temporarily phosphoresce beautifully upon a hot shovel in the dark; put the same powder when cool a second time upon the shovel, and it will not phosphoresce again unless meanwhile it has been sufficiently exposed to light. Here we have the results of luminous energy stored up by some means in powdered fluor spar, without any evidence of the intervention of chemical decomposition. Professor Dewar has stored up the phosphorescent energy of luminous paint spread upon a glass plate, by keeping the plate at an excessively low temperature for days or weeks; on taking it from its frigid receptacle and breathing upon it, once more it begins to shine in the dark until its original normal amount of phoshorescent energy is exhausted. He has facilities at the Royal Institution for producing the extremely low temperature necessary, as there are appliances on the premises by which even oxygen can be liquefied by intense cold and pressure. An analogy upon a large scale may now be given. Suppose the earth to be an atom of chlorine and the sun an atom of silver, and their present relations in the matter of distance to be normal. At the present time the elliptical orbit of the earth is so nearly circular, that if it were to be drawn to the reduced scale of a yard in diameter upon the wall, it would be necessary to measure it for the observer to make sure that it was not a true circle. Because of the perturbations set up by the planets, it at times assumes a very elliptical form, so as to give the earth a short, blazing summer, and a very long, cold winter; indeed, this furnishes the foundation for the hypothethis most popular with astronomers as to the cause of the glacial epochs. It takes many thousands of years for the orbit to change from its most circular to its most elliptical form, and in the latter case, when the earth is farthest from the sun, evidently its attraction by the sun is weakest, and it is more liable than at any other time to be separated from the sun, should any stronger attracting body come near enough. Here then, on a large scale, we have something suggesting that upon a small scale modifications set up by a disturbing force in the relative motions of two adjacent particles of matter may possibly last for an exceedingly long time. In intermolecular motions there may sometimes be small tendency when a change, say, in merely the plane of atomic vibrations is set up, for the particles to return quickly to their normal positions.

The established discoveries of modern science in relation to molecular physics cannot be excluded from photography, and as atomic motions invariably underlie and precede chemical changes, they must be taken into account in any chemical, physical, or other hypothesis of the production of the latent image by light.

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LETTERS ON LANDSCAPE, ADDRESSED TO AN AMERICAN FRIEND.—No. I.

BY H. P. ROBINSON.

Dear Blank,—As these letters are to be published, I must call you Blank, your name as yet not having any interest for photographers, but we may be permitted to hope the time will come when your true appellation will be that of a shining light in the art which has light for its source.

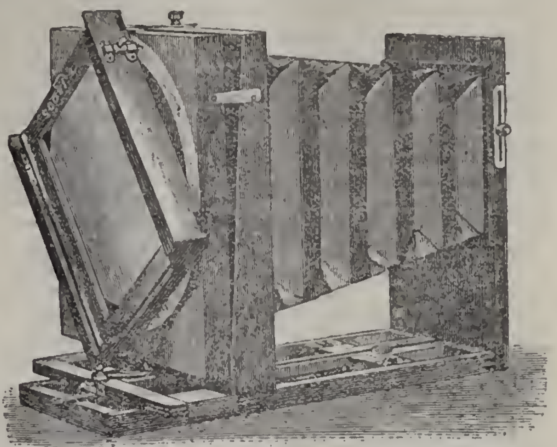
I now propose to go into the subject of landscape more particularly as it can be represented by photographic means. As long as you were playing with toys—ten dollar sets—I was compelled to decline giving you any instruction, as I could have been of very little use to you. I have not a word to say against these cheap sets of apparatus, which make me wonder how they can be made for the money, and I have taken, and seen taken by amateurs, admirable little pictures with them, but serious art requires serious tools, and should not be satisfied with less than the best. You have now, however, got over the youthful maladies of the art—the chicken pox and measles of photography—and you have tried the usual remedies, such as endeavouring to find a means of photographing in colour, and a remedy for bad art in a new developer. You have also ceased to ascribe a lack of brilliancy in your negatives to want of definition in your lens. You have, in fact, got over the initial little difficulties and troubles, and are ready to provide yourself with proper tools, so that you will have no difficulty in following out my instructions, and you will find your work interesting.

You are an amateur with leisure, which gives you a great advantage. Hard working professional photographers can afford but little time for prosecuting the better parts of their art. I remember how surprised you were when I told you that I seldom devoted more than a fortnight in the year to landscape photography, and then had to take my chance of weather. But after all, shortness of time for actual working has its compensations. I got through a great deal of work in the time, because I have everything ready, everything cut and dried for use. I am always on the watch for effects and subjects, and ideas of all sorts, and jot them down in a pocket book, so that perhaps a subject or scene is a year or two old before I use it. But I have the subjects so "handy," if I may so call it, in my mind, that they are ready for use at any moment, and I take care when I have my landscape holiday that everything shall be in perfect order, including the models for figures, and that nothing shall be doubtful, except the weather. It may turn out bad, but we "trust the larger hope." Indeed, even in that matter of the weather, we are not so much in doubt as formerly. We turn to the meteorological reports in the morning papers to see what kind of weather you are sending us from your side of the water, and "govern ourselves accordingly." Although you never predict anything but storms, we learn how to dodge between them.

Just as the proverbial millionaire began his working life with half a crown, so has many a now well-known photographer begun his art with a cigar-box and spectacle lens, and it is not easy for the new generation of photographers to understand the difficulties through which the beginner of thirty years ago had to grope his way. To a modern dry plate worker it would be like listening to a foreign language if I told him of some of the difficulties of the collodion process. What does he know of comets, oyster shell markings, and lines in the direction of the dip? In apparatus, also, the early photographers had to put up with what they could get, and that was not always very convenient for use. Weight and French polish seemed to be the chief objects aimed at by the makers. Both camera makers and opticians were very stiff-necked in their generation, and would not allow that photographers knew what they wanted, so the camera was set up almost as solidly as if it was an astronomical telescope, and the lens was made with the definition of a microscopic objective with the focus all in one plane. We have changed all that. We can now get apparatus and lenses adapted to the photographer's wants. Cameras, especially landscape cameras, without any loss of beauty in their manufacture, have been made very much lighter, and lenses are made sufficiently optically imperfect to diffuse the focus more in accordance with what the eye sees. We are proud of our cameras and lenses in England, but a glance through the catalogues of the Scovill Manufacturing Company, and other makers, convince me that you need not go from home to make your purchases.

And now I come to what you really will require. I take it that you will not give your ambition at the outset too great a chance of over-leaping itself in the matter of size. The time will, I hope, come when you will feel the compelling influence of sufficient skill to make your work become visible in exhibitions, and you will feel you cannot do yourself justice in a less size than 17 by 14, but at present 10 by 8 will be large enough for you. You can put as much art into a picture of this size as into one of much larger dimensions, and the smaller size saves you a lot of worry and bother in porterage.

The best camera I have seen of American make is the Flammang, made by the Scovill Company. This essential tool is light, strong, and has all the necessary movements, and has the great advantage of having a revolving back, so that the plate may be used vertically or horizontally without trouble. Above all, it has the great merit of being not too clever. There are some cameras which take an education to understand, and are almost impossible to use, but with the Flammang camera, a photographer of even small experience knows where he is at once, and what to do. In purchasing a camera it would be as well to secure one to which an Eastman's spool-holder could be adapted at some future time. At present you had better use plates, and go on to paper when you have had sufficient experience to enable you to judge which method you prefer. The tripod stand should be firm and rigid, as well as light and portable. This you will easily judge for yourself.



The lens is always considered the most important of all the tools the photographer employs. So it is, but I should like to say boldly that, within limits, I do not care what make of lens I use. It is as well to have the best your means will allow, but there has always been too much made of particular variations in the make of lenses. It has been the fashion to think too much of the tools, and too little of the use made of them. I have one friend who did nothing last year because he had made up his mind to buy a new lens, and could determine whose make it should be, and he was tired of his old apparatus. His was of the order of particular and minute minds that try to whittle nothing to a point. I have another friend who takes delight in preparing for photography, and spends a small fortune in doing so, but never takes a picture. But I am wandering from my subject. You will want a lens for general use. This should be of the rapid rectilinear form, and should not include too wide an angle. The focus should not be less than 13 inches for a 10 by 8 plate. I have heard good accounts from different quarters of a lens that is coming into great use in the States—the "Wale" lens—and from what I hear of it, it is just the lens you will want as your chief instrument. You will find it useful for all ordinary landscape purposes, as well as outdoor groups and portraits.

There are some subjects which would be impossible with a narrow angle lens, such as interiors and subjects in confined positions, where you cannot get far enough away to include as much as you want with the ordinary lens. For this purpose you must have a lens that includes a wide angle of view, and I don't think I could do better than recommend Morrison's wide angle of eight inches equivalent focus. To be quite complete you should have a 10½ inch also, as well as a single meniscus, but this is not necessary at present.

I need not go into the question of apparatus further. The experience you have already had will have taught you what else you will require, but I have one or two words to say on plates and developers.

Find one good make of plate, and learn all about it; all its peculiarities; how long it takes under the developer before the image should appear; how long a properly exposed plate takes to become rightly intense, and how it looks, and stick to this plate. I don't say don't try any other at any time, but make the chosen plate the standard. To be continually using different makes of plates confuses the judgment, and you scarcely know where you are. I do not recommend the quickest plates that are advertised, because some plates are made so rapid as to be unmanageable. We ought by this time to be able to give the sensitiveness of any plate to the sensitometer, but I have never known one on which I could place the slightest reliance. Much confusion prevails. One maker's "30 times" is quicker than another's "40 times," while the names given to plates are most misleading. The plate I like best and use almost entirely—that is, when I am not compelled to take a very quick picture—is called by its maker "special instantaneous," but it is by no means a quick plate compared with some others. There is one thing about which you may be quite sure. If the plate is not covered with a good body of emulsion, if it looks thin, blue, and poor, you will not get the best obtainable negative on it.

The last word I have to say in this letter is about developers. Many amateurs try every newly suggested modification of the developer as it comes out, and fritter away their time and muddle their brains with weight and measures, and homœopathic differences in proportions. My advice is—and I cannot state it too strongly, particularly as you wish to be an artistic photographer, and not merely a dabbler in chemistry—keep to one developer and let that be as simple as possible. I have used one developer, only since I commenced operating with dry plates, and have not found any want of quality in my negatives, but perhaps I am easily pleased in that respect. This developer was suggested by Mr. B. I. Edwards, and is as follows:—

No. 1.—	Pyrogallic acid	1 ounce
	Citric acid	40 grains
	Water	7½ ounces
No. 2.—	Bromide of potassium	120 grains
	Water	7 ounces
	Ammonia, ·880	1 ounce

To make the developer take three ounces of water and add one dram of No. 1 and one dram of No. 2. This quantity should be sufficient to develop a 10 by 8 plate. There are occasions when the quantity of No. 2 should be increased or diminished. If you prefer any other developer, such as the carbonate of soda, which is now much used, I have no objection; all I ask is, that you should keep as much as possible to one developer, and study it thoroughly.—*The Photographic Times.*

HOME PORTRAITURE.

BY T. N. ARMSTRONG.*

Having briefly glanced at lighting, posing, and expression, let me next say something about the needful apparatus. A beginner will very likely attempt this class of work with his ordinary landscape camera and symmetrical lens, with the result that somehow or other they do not produce pictures that can at all compare with professional work, and very likely they will throw it up in disgust. Experience has taught me that home portraiture requires close study and the employment of accessories which, in nine cases out of ten, an amateur does not possess. First, as to the camera. If you are going to confine yourself to simple heads relieved on a white background, like some of the examples I have brought with me to-night, your ordinary landscape camera will suffice; but if you aim at more pretentious work, then a studio camera, with its side and top and bottom screws, is a necessity, so as to get the sensitive plate on the same plane as the position of your sitter. Then, again, the camera-stand. Very few amateurs are possessed of other than an ordinary tripod which is no use for indoor portraiture. A good, steady, firm stand, capable of raising and lowering the camera rapidly, is another necessity.

Then as to the lens. I find a very prevalent opinion exists that any sort of a lens will do. Someone has said, I forget who, that any hammer will drive a nail, and any lens will take a picture; but no lens will do all classes of work, any more than one hammer will. In portraiture, a good portraiture combination is a *sine quâ non.*

Another matter which may seem of small importance to many, is the cap of the lens not fitting properly. When I say not fitting properly, I do not mean too loosely on the hood, but just the right thing; if too tightly, vibration is likely to ensue when removing it. Even such little matters as these are of importance. I know from experience how necessary it is to guard against such, for when I acquired a high-priced portrait combination from one of our best English makers, the cap fitted so tightly that it was impossible to remove it without shaking the camera, and many a plate I spoiled through it. The sitter was blamed, of course.

Head-rests I never use. I have one, but it is a nuisance. When I get a sitter who cannot keep steady for a few seconds, I adopt some pose whereby a natural rest comes into play.

Get a good background by all means. I prefer what is called empire-cloth stretched on a frame, one side light for vignetted heads, the other side a dark slate colour, and on the top I have two rods nailed, which can carry curtains at either side I find these curtains very handy; they can be used, or not, at will.

Hitherto I have said nothing about development; this, at first, will give a beginner some trouble The chief point is to obtain proper density. Your negatives must not be too thin nor yet too dense, but just the right thing. It would never do to develop a white satin dress with as much pyro as a dark glen Experience soon teaches a thoughtful operator. I would strongly recommend beginners to stick to one brand of plates, and let these be as rapid as possible, then practice will teach you how to mix your developer so as to get proper printing vigour in your negatives. I never intensify. Should you happen to over-expose, and so get your plate too thin, I know of no better way of gaining density than that recommended by the Paget Company—I mean their citrate of ammonia formula. By its use, when all detail is out, development is stopped, but the image already formed is allowed to grow stronger.

And now I come to that much-maligned operation of retouching. I do not care what may be the opinion of those opposed to the use of the pencil, I fearlessly assert that retouching is the professional sheet anchor in this branch of photography, and I should like to see the studio that could be conducted without its staff of retouchers. Until I took lessons and became proficient in retouching, I was quite cognisant, and so were my friends, that my attempts at portraiture were miserable failures; the moment I understood how to retouch and model my negatives, that moment I felt I had entered into a new sphere in photography, and then I saw for the first time I had mastered portraiture.

Not only do I advocate retouching, but I recommend the use of every dodge under the sun to improve not only the negative, but also the appearance of the sitter when going to be photographed. I remember once being told by an amateur who had a very exalted idea of his own art culture, on looking at one of my pictures—it was that of a lady friend who had a very pretty face—after examining it and confessing it was very nice, but retouched to death, he thought.

"Do you think so?" I replied.

"Yes," he answered; "you retouch too much, Armstrong, I think." Thereupon I went to my cupboard and produced the negative. "Show me the retouching." He stood amazed, and confessed he would not have believed it! I told him he had something to learn yet.

In this case I had taken the liberty of freely using the puff and powder pot, of doing up the eyes and eyebrows, even going so far as to paint the lips quite in the professional-beauty style; and who shall say my picture was not like the original when she sat down? I often hear it argued that retouching kills the likeness, and spoils the texture of the picture; all I can say is, a good retoucher will do nothing of the kind, but, on the contrary, will remove those imperfections in the negative which is necessary to the yielding of a pleasing and faithful likeness.

I am not here to-night to tell my amateur friends how to retouch, but merely to say that it is my humble but honest opinion to be an absolute necessity if you care to turn out pictures which are to be acceptable to your friends and a credit to yourself. Not only do I advocate retouching, but I go further, and say, adopt every means, such as the employment of ground-glass varnish, mineral paper, &c., for the improvement of your negatives, and leave no stone unturned to produce results that are pleasing and life-like.

Lastly, as to finishing and mounting. Exercise your own taste in this respect; if you have a leaning to and are fond of enamelled pictures, enamel by all means. Very likely the most of your friends will say how beautifully finished, while on the other hand you will occasionally meet with some kind friend who will consider your labour in vain, likening your enamel to his patent leather boots. Taste differs in this respect, and perhaps it is well it is so. I prefer to mount my pictures in optical contact with glass, and to enclose them in the good old cases which were all the rage in the grand old collodion days. We seldom see these cases now; but I have brought a few of them with me to-night just for "auld lang syne." Then, again, there are the metal rims; another very nice way of finishing a picture. These rims are not expensive, and if it is desired to hang up a picture, they are the very thing. To an amateur they have their advantages, for when presenting your friend with his picture, as a rule, he has not the cheek to ask for a dozen, as is often the case when mounted on cards. You can with truth say, I do not mount on cards, but if you want a dozen or so, here's the negative, get a professional printer to print them.

The mounting of the prints in optical contact is very easily done, if gone about properly. In 1886 the editor of *The British Journal of Photography* asked me to contribute something to his yearly "Almanac," and I sent him a short article on "Optical Contact," which you will find on page 118 for that year. If you follow out the instructions I give, you will find it an easy matter to mount your prints in optical contact.

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* Continued from page 443.

And now, ladies and gentlemen, I have finished my task. Much more could be written about this fascinating branch of photography, but I have already exceeded the time allowed. I have told you plainly what little I know, and what I believe to necessary to success. If what I have communicated should, in the smallest degree, be the means of assisting any of my amateur friends to overcome their difficulties, I shall be satisfied; while on the other hand, if you deem me a bore, give me a back seat at next Convention.

Patent Intelligence.

Applications for Letters Patent.

9788. Thomas Simpson Skelton, 80, Coleman Street, London, E.C., for "Improvement in the preparation of single transfer papers used in producing carbon photographs."—July 12, 1887.

9948. Thomas Parsons Watson, 313, High Holborn, London, for "An improved spring fastening for the shutters of dark slides of photographic cameras."—July 15, 1887.

9954. Arthur Rayment, 34, Southampton Buildings, London, W.C., for "Improvements in photographic cameras, and in the shutters therefor."—July 15, 1887.

Specifications Published.

6673. Alfred Julius Boult, of 323, High Holborn, in the county of Middlesex, M.I.M.E., for "Improvements in photographic cameras or instruments." (Communicated from abroad by John Robert Connon, of the village of Elora, in the county of Wellington, in the province of Ontario, Canada, photographer.)—Dated 6th May, 1887.

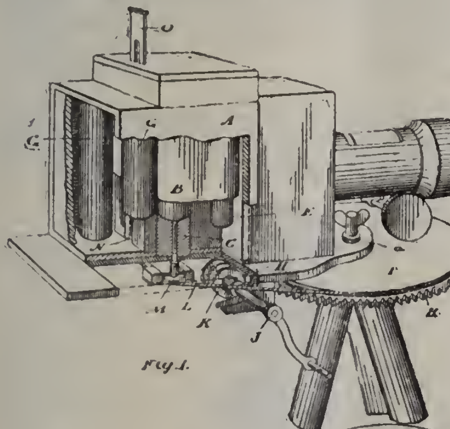


Fig. 1.

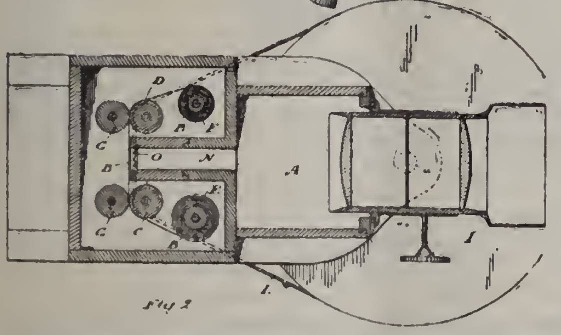


Fig. 2

The object of the invention is to arrange a photographic instrument by which a continuous panoramic view of any scene within a circle or portion of a circle may be produced; and it consists essentially in pivotting the photographic instrument on the optical centre or axis of the lens, and so arranging the sensitive film that as the instrument revolves the said film shall be presented to the focus of the lens exactly as required to receive the image formed by the lens, substantially as hereinafter more particularly explained.

Fig. 1 is a perspective view, partially in section, showing an instrument constructed in accordance with this invention.

Fig. 2 is a sectional plan of the instrument.

Although the construction of this instrument may be considerably altered from that shown in the drawing, the said construction will be sufficient to illustrate the intention and operation of this invention, so that others skilled in the art of photography will have no difficulty in understanding it.

The first point which must be observed is that the instrument A must be pivoted at *a*, which represents exactly the optical centre or axis of the lens. It is also necessary that the sensitive film, whether it be placed on paper B, glass, or any other substance, must be placed on a radius struck from the optical centre *a*.

In the drawing, the sensitive paper B is shown passing around the two rollers C D, which are located so as to hold the paper B at the proper distance from the optical centre *a* mentioned. This paper B is stored on the roller E, and as it leaves this roller, as hereinafter described, it is wound on the roller F, as hereinafter explained. The rollers G are merely friction rollers for the purpose of holding the paper B against the rollers C D as shown.

A spur wheel H is fixed to the circular top I of the stand. A crank handle J is journalled on the bottom of the instrument A, and has fixed to it a worm-pinion K, which meshes with the spur wheel H as shown. Consequently, the revolving of this crank shaft J will cause the instrument A to revolve upon its pivot *a*. The circular top I is grooved so as to receive the cord L, which passes around the circular top I, and around pulleys M, fixed or attached to the spindle of the rollers C D; consequently, the said rollers must necessarily revolve with the instrument A, causing the paper B to leave the roller E, pass between the rollers C D, and be wound upon the roller F; this latter roller being provided with a suitable spring so as to cause it to take up the slack paper, bringing into the focus of the lens a continuous supply of the sensitive film, so that a continuous panoramic image is produced on the sensitive paper as the instrument is revolved on its axis.

In order that only a small portion of the sensitive film shall be exposed to the action of the lens, a narrow vertical passage-way N is formed, located between the lens and its focus. As it may be sometimes desirable to reduce the width of this passage-way, a slide O is provided to fit into the passage-way N. In this slide a narrow vertical slit is made representing the exact width of the space on the sensitive paper which is wished to be exposed at any one time to the action of the lens.

From this description it will be seen that by arranging a photographic instrument as I have just described, a complete panoramic and continuous view may be secured at one exposure of the entire country embraced within a circle.

Having now particularly described and ascertained the nature of the said invention as communicated to me by my foreign correspondent, and in what manner the same is to be performed, I declare that what I claim is:—

1. A photographic instrument pivotted on the optical centre or axis of the lens in combination with a sensitive film arranged so that as the instrument revolves, the said film shall be presented to the focus of the lens, exactly as required to receive the image formed by the lens, substantially as and for the purpose specified.

2. A photographic instrument pivotted on the optical centre or axis of the lens, in combination with a sensitive film placed on paper, glass, or any other substance located on a radius struck from the optical centre or axis of the lens, substantially as and for the purpose specified.

3. A photographic instrument pivotted on the optical centre or axis of the lens, in combination with a sensitive film placed on paper, glass, or any other substance located on a radius struck from the optical centre or axis of the lens, and of a narrow passage way located between the lens and its focus, substantially as and for the purpose specified.

4. A photographic instrument A, pivotted on its optical centre or axis *a*, around which it is caused to revolve, in combination with the rollers C D, between which the sensitive paper B passes, and which are caused to revolve with the instrument A, so that a fresh surface of sensitive film shall be brought continuously within the focus of the lens as the instrument A revolves, substantially as and for the purpose specified.

5. A photographic instrument A, pivotted on its optical

centre or axis *a*, around which it is caused to revolve, in combination with the rollers E F, arranged to carry the sensitive paper B, which is carried over the rollers C D between the rollers G ; the rollers C D being caused to revolve with the instrument A, so that a fresh surface of sensitive film shall be brought continuously within the focus of the lens as the instrument A revolves, substantially as and for the purpose specified.

6. A photographic instrument A, pivotted on its optical centre or axis *a*, in combination with sensitive film located within the focus of its lens on a circle struck from the optical centre or pivot of the instrument, substantially as and for the purpose specified.

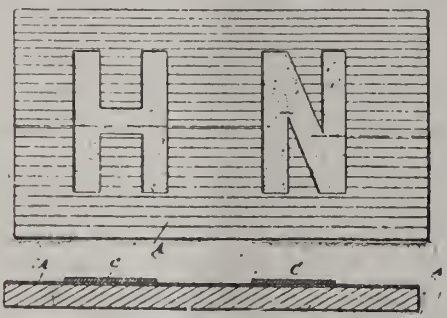
7. A photographic instrument A, pivotted on its optical centre or axis *a*, a sensitive film located within the focus of its lens on a circle struck from the optical centre or pivot of the instrument, in combination with a narrow passage way located between the lens and its focus, and caused to revolve with the instrument, substantially for the purpose hereinbefore explained.

10770. John Urie, Senior, and John Urie, Junior, both of 83, Jamaica Street, Glasgow, Lanarkshire, Photographic Artists, for "Improvements in photographic printing machines."—Dated August 23rd, 1886.

The claim is for details of exposing machines of the Fontayne type.

Patents Granted in America.

366,527. Ludwig Lendry, New York, N.Y., assignor, by mesne assignments, to Josephine Lester and Nina Lendry, both of same place. "Process of producing designs on glass plates."—Filed September 3, 1886. Serial No. 212,599. (No model.)



Claim.—1. The herein-described process of producing designs on glass plates, consisting of providing a glass plate with a coating consisting principally of Egyptian asphalt, colophony, coal-tar, bicarbonate of potassium, caoutchouc, and ozokerite, and then placing a pattern of the design to be produced on the said plate, after which the plate and its pattern are exposed to the action of light, and the pattern is removed, and the plate is washed with oil, substantially as described.

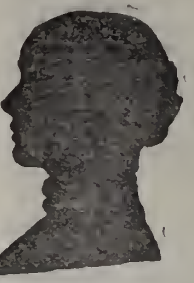
2. A new article of manufacture, consisting of a glass plate having a permanent coating consisting principally of Egyptian asphalt, colophony, coal-tar, bicarbonate of potassium, caoutchouc, ozokerite, and gum-arabic, and designs printed on the said glass plates with the aid of light and patterns, substantially as described.

3. The herein-described composition of matter used for producing designs on glass plates, consisting of Egyptian asphalt, coal-tar, bicarbonate of potassium, caoutchouc, gum-arabic, colophony, ozokerite, and turpentine or benzine, in the proportions specified.

Correspondence.

PHOTOGRAPHY AND SILHOUETTES.

Sir,—In reply to your request I enclose an average silhouette, which I cut from an ordinary print taken from the original negative. Neater fingers than mine would have cut it out better. Sometimes I have cut out the silhouettes from prints as soon as they were removed from the printing frame, and left them to blacken ; they suited my particular purpose, but it is needless to say that their tint was not agreeable. I have sometimes printed them as "blues" (cyanide prints) on the paper used by architects, and these are very effective.



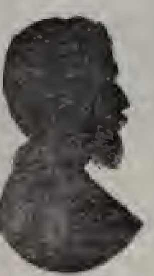
Those who are acquainted with Lavater's original work, of which the small English translation is little better than a caricature, will understand the value of well-made silhouettes. They are particularly useful in studying family characteristics, which, I think, are, on the average, far better observed in profiles than in any other one view of the features. The truth of this statement may be verified in church, where whole families, each occupying a pew, can often be seen sideways, and each family can be taken in and its members compared with a single glance. The instances will be found numerous in which the profiles of a family are curiously similar, especially those of the mother and her daughters. This is most noticeable where their ages and bodily shapes differ greatly, as when the daughters are partly children and partly slim girls, and the mother is not slim at all.

Permit me to take this opportunity of disclaiming a misprint in the very first word of my letter the week before last. It was printed "My" ; it should have been "Any." The effect of the "My" is to give a tone of presumption to what I wished to say, quite foreign to my real intention.

Francis Galton.

Dear Sir,—F. Galton's letter reminded of my own attempts about two years ago, one of which I enclose. It may be considered under-printed, also over-exposed. The few I did excited but little attention. As photos. there is but little work in them, and they could be supplied cheaply. I think F. G.'s plan of cutting out not an advantage..—Yours truly, A. H. Cade.

Cornhill, Ipswich, July 14.



Proceedings of Societies.

Photographic Society of Great Britain.

A special general meeting was held on Tuesday, the 19th inst., in the Gallery, 5a, Pall Mall East, to consider certain alterations and additions to the existing laws of the Society. The chair was occupied by James Glaisher, F.R.S., president.

The Chairman, in opening the proceedings, explained that owing to the important character of the suggested alterations, the Council had been a long time in discussing the form of the new rules, hence the reason for holding the special meeting during the present hot weather. He should have preferred for such serious business that a larger number of the members had been present. Having stated that a copy of the alterations had been sent to every member, he proceeded to read the clauses in the new code.

These were then dealt with as far as Rule 22, when an adjournment was decided upon until Tuesday, October 11th, when discussion upon the remaining seventeen clauses will take place. A report of the discussion will appear next week.

London and Provincial Photographic Association.

A meeting was held on the 14th inst., the Hon. Secretary, J. J. Briginshaw, presiding.

Several of the members who attended the Convention at Glasgow gave favourable accounts of the proceedings and general arrangements. Copies of the prospectus and rules relating to the amateur photographic exhibition to be held in October under the auspices of the London Stereoscopic Co. were passed round, and at a later period the prospectus of the Photographic Society's Exhibition in Pall Mall was placed upon the table.

W. E. Debenham raised objection to the term photograph in colours for any photograph produced with colours applied by hand, and the meeting agreed that the expression could not properly be so applied

J. Traill Taylor understood a photograph in colour to mean heliochromy, or the colour produced by nature.

A question then arose regarding the non-applicability of diaphragmatic shutters for use with certain forms of lenses.

H. M. Smith found, with a Darlot's series, there was an alteration of focus. This was thought to be an extreme case. Diaphragmatic shutters found the most favour of any among those who spoke upon the subject.

L. Medland showed photographs of animals in the Zoological Gardens, and other subjects. One, a blurred image taken by means of a pinhole in black paper, was thought by several to be a bad case of diffraction.

Dark patches in prints, due to examining plates during development by holding them up against an unsafe light, also came under notice, and the comparative safety of "golden fabric" as a screen was spoken of by several. At the same time, the slovenly practice of leaving emulsion on the back of plates proves to be the cause of many curious experiences.

Birkenhead Photographic Association.

The ordinary meeting was held in the Free Public Library on the 14th instant, J. A. Forrest in the chair.

H. Williamson, Dr. Stansfield, T. S. Mayne, and Dr. Proctor were elected as members.

The Secretary had an interesting exhibit of a ball-headed camera stand by John Brown, a member of the Belfast Photographic Society. It was freely criticised, and pronounced a great improvement on stands somewhat similar in principle. The inventor had used it extensively in yachting excursions, and in places where the ground was exceedingly rough and uneven, but had never found, no matter what the position of the tripod, any difficulty in getting the camera almost instantly properly placed, and at the same time perfectly rigid. The ball to which the camera is screwed is of wood, and is held by a series of metal clips, which are contracted by pressing a small lever on the tripod proper, being then immovable until released.

B. J. Sayce exhibited an album of prints made entirely from paper negatives which had not been oiled; the results were very fine, and had Mr. Sayce made a secret of the matter it would have been impossible to have said that they were not from glass, printing without rendering the negatives translucent, seeming to hide the granularity of the paper, a defect the oiling seems only sometimes to make apparent.

A number of prints of the race in the Mersey between the yachts *Thistle* and *Irex* were exhibited by various members. J. H. Day had a number of Marple Hall, near Buxton, which were exceedingly effective; whilst the President exhibited an enlargement of the moon done by himself so far back as February, 1854, in conjunction with Mr. Hartnup, the Astronomer to the Mersey Dock Board. The exposure had been one minute and a half, the resulting negative giving a figure of only a little over an inch, yet so perfect was it that the enlargement was quite sharp, showing all the principal craters and various surface markings.

The Jubilee excursion to Trefriw was productive of an immense number of prints, a collection of which was made for presentation to Alderman Samuelson, who had originated the trip.

J. Lange gave an interesting practical demonstration of the working of Eastman's stripping films. He had produced some most satisfactory results, but had to depart in some respects from the recognized formula. Coating the glass plate with collodion not acting, he had dissolved four grains of unvulcanized Para bottle rubber, cut fine, in one ounce of pure benzine; this, when brushed quickly over the plate, gave an exceedingly even substratum. Naphtha may be used in lieu of benzine, but when it is, the quantity of rubber has to be increased to six grains. Mr. Lange spoke of the difficulty of getting it to dissolve, requiring from two to three days to attain that result.

H. N. Atkins suggested that if, instead of the rubber as sold in strips in the shops, he got the ordinary article and used the white inner portion, it would dissolve much more rapidly, not being affected by the atmosphere, which had a tendency to make it hard.

Mr. Lange also threw out as a hint to the uninitiated that the films required to be developed to about double their seeming density, as otherwise, when they came to be printed from, they would be found to be too reduced to give a satisfactory result.

Amateur Photographic Association.

A Council meeting was held on the 14th inst., at 12, Old Bond Street, the Duke of Teck in the chair. The minutes of the last meeting having been read and confirmed, the following members were elected :—The Earl of Kilmorey, Alfred Mulholland, Colin Boyd, Dr. Drew, Hamilton Emmons, and F. Gowan.

The Hon. Secretary laid before the meeting copies of all the pictures contributed for the current year, and J. Glaisher read his report, which, after congratulating the meeting on the exceptional excellence of the contribution for the present year, stated that there were in the first class 138 pictures, the second class contained 109 pictures, the remainder of the pictures being comprised in classes three, four, and five.

The following prizes were awarded :—H. E. White, first prize, a large silver goblet; Mrs. Hobson, second prize, a silver goblet; W. Muller, a water-colour drawing in frame; Geo. Brook, a silver goblet; R. Leventhorpe, a silver goblet; R. Leventhorpe, a silver goblet; W. T. Hobson, a water-colour drawing in frame; R. O. Milne, a portrait album elegantly bound; W. Vanner, a water-colour drawing in frame; Baron Liebig, a portrait album elegantly bound; W. Gaddum, a landscape album elegantly bound; and to Lord de Ros, a portrait album.

Certificates of honourable mention were awarded to General Sladen, Major Board, F. H. Shaw, Colonel Biggs, A. Tagliaferro, L. F. Reichling, and C. F. Pritchard.

North Surrey Photographic Society.

At the meeting on July 6th Lewis Wolff (Chairman) explained and demonstrated the method of manipulating his self-adhesive mounting boards. These mounts are of the usual gilt bevilled edge description, and are coated with an adhesive substance which, when dry, does not alter their appearance in any way. The prints to be mounted, if dried, are soaked in water for a few moments, or are taken from the last washing and placed between blotting-paper to remove superfluous moisture. They are then placed in position on the mounting board, covered with a piece of paper, and smoothed down with the hand. By the use of these mounts the trouble of making starch is avoided, and the vexed question of a suitable mountant completely answered. It was announced that the mounts, which are the subject of a patent, would be a commercial article.

It was announced that the Hon. Sec. offered a prize of one guinea for the best series of six prints from this year's negatives, the prize to be awarded at the first meeting in December.

An outdoor meeting of the Society was arranged for July 30, at Cassiobury Park, Watford. Trains from Euston at 1 o'clock and 1.40 p.m. The Society then adjourned to October 5th.

DERBY PHOTOGRAPHIC SOCIETY.

The members of this Society had an outdoor excursion to Monsal Dale and Cressbrook on July 2nd, which was well attended, and some excellent negatives obtained. On Saturday last the outing was to Rowsley and Haddon Hall. The attendance was a very good one, and although a severe thunderstorm visited the district and marred the proceedings during a portion of the afternoon, upwards of sixty plates were exposed in and about the Hall, where subjects for the camera are abundant.

The next outing will take place on July 30th, to Wingfield Manor.

SOCIETY OF AMATEUR PHOTOGRAPHERS OF NEW YORK.

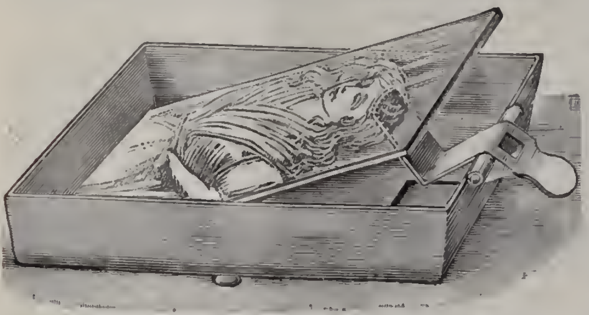
A lantern exhibition took place on June 8, and the President announced that the Photographic Section of the American Institute, of which H. J. Newton is President, had appointed a committee to supervise the arrangement of the usual summer excursions, and suggested the propriety of this Society appointing a similar committee to act in concert with them. The suggestion was adopted, and the President will shortly announce the committee.

Talk in the Studio.

Photographic Society of Great Britain.—The usual monthly technical meeting will take place on July 26th, at eight p.m., at the Gallery, 5a, Pall Mall East. Open at 7 p.m. for Journals and conversation.

Exhibition of the Dundee and East of Scotland Photographic Association.—This Society announces that an exhibition will be held in the Albert Institute, Dundee, during February in next year, and communications should be addressed to the Hon. Secretary, James Rathray, 82, High Street, Dundee.

Anderson's Wavelet Bath and Developing Dish.—Some time ago we noticed this, but have just received specimens of a series made by W. Tonks and Son, of Birmingham, in which the manufacture has been much improved, the dish being stamped up out of a sheet of brass so as to be without seams or joins at the corners. The sketch shows the action of the dish for rocking, and also for lifting the plate; and as the whole arrangement is very light, and with ordinary usage unbreakable, it should be useful to the tourist. The brass is electro-silvered.



Watts' Bijou Actinometer.—We have received this instrument. It consists of a small tin box such as used for wax matches, and inside is a dark brown tablet along which a strip of sensitive paper is drawn so as to expose about a quarter-inch square at a time. In fact, it is virtually the same as Johnson's actinometer, but with a tin lid instead of a glass lid. The idea of the vendor is that the outdoor photographer should expose the sensitive paper until a tint corresponding in intensity to the brown tablet is registered, and during this exposure he should take count of the seconds (174 in a trial we made). This number must be divided by four, multiplied into a "subject number" which is found on the inside cover of the box. (Sea and sky is $\frac{1}{4}$, and heavy foliage foreground is 5). The product is now multiplied into a stop number on a new standard, for which reference has again to be made to the lid of the box, and the result must now be divided by a number representing the sensitiveness of the plate (apparently according to no recognised standard). The triumphant landscapist is at last in possession of the number of seconds he ought to have exposed his plate.

Sale of a Wedgwood Heliotype.—We have received the following communication from H. Boyle:—"It may interest your readers to know that on Monday next, July 25th, Messrs. Sotheby, Wilkinson, and Hodge will sell the earliest known heliotype taken by Thomas Wedgwood, 1791, with 26 *fac similes* of the same; and also two other early photographs. These interesting curiosities belonged to the Wedgwood collection of the late Joseph Mayer, F.S.A., of Liverpool, and are included in the catalogue of sale under lot 739."

International Exhibition at Brussels in 1888.—Photography is to occupy a prominent place in the international exhibition to be held in Brussels next year, and the various photographic exhibits will come under section B. This division is to include the more common photographic processes, as well as collotype, photographic printing in colours, photo-engraving, Woodburytype, photo-lithography, and photo-zincotype.

Collodion Coating for Pills.—Berubeck, a German pharmacist, recommends the use of collodion as a coating for pills which are intended to be soluble in the intestinal contents. Flexible collodion is to be used, and the pill must be absolutely dry.—*American Druggist.*

Photographic Club.—The subject for discussion on July 27 will be "Photographing Flowers." Saturday outing at Richmond. Meet at Metropolitan Station at Richmond at 2.30.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

A. W. W.—1. It will be best to assay the mixture, as the proportion of ash in blotting-paper is very variable. With respect to the rough estimate of value, you must remember that an ounce of silver consists of 480 grains, and that English silver coins are not, like gold coins, issued with a metallic value equal to the face value. 3. Fuse a sample of it with twice its weight of carbonate of soda, taking care to use a sufficiently large crucible, and a bright white heat.

A. B. C.—The faint image is a sufficient guide—or, at any rate, we know persons who have found it so—and the whole series of operations are conducted in just the same way as in silver printing.

J. B.—It was published as received from the representative of the Secretary.

B. J. T.—As far as we can judge, such an arrangement is likely to be quite satisfactory.

G. R Maenprize.—A drop shutter will answer very well with such a lens when the light is good and the plate tolerably sensitive.

E. E. E.—If the albumen colour is properly mixed with fresh albumen, and coagulated with alcohol, it should not come off; but if the spots are small, there is no objection to using oil colour, except that it takes rather long to dry. If you use oil colour, use nothing but turps for softening the tube colours.

W. H. H.—All the points you refer to have been noted.

Photo.—1. It appears to have been coloured with litmus. 2. Cement them together with Canada balsam; it is well to warm them slightly, and take care that the balsam is quite free from solid particles. 3. Soak in methylated spirit, and brush the surface with a soft camel's hair brush.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1508.—July 29, 1887.

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HUTCHINS' PHOTOGRAPHIC SPECTROSCOPE.

C. C. Hutchins, of the Jefferson Physical Laboratory, Harvard University, U.S.A., describes as follows, in a recent number of the *American Journal of Science and Art*, an arrangement which promises to be useful.

The constant demands of spectrum analysis for ever-increasing accuracy can be satisfied only by instruments of the highest dispersion, and most perfect defining powers; and when applied to photography, the dispersion must be produced directly, and not by enlarging-lenses at the camera. The large apparatus of Rowland does this most beautifully, as the writer, who has used it for the past year, can testify; but the fact that a large room must be set aside for its accommodation, and moreover that the large concave gratings are very difficult to obtain, will forbid its use to most workers.

I have therefore devised the following simple, and it would seem, upon a short trial, effective arrangement for producing the desired results.

A rather long slit is placed at the focus of a crown glass (or better, quartz) lens of forty feet focus. The ray from the slit, after passing through the lens, falls upon a large flat grating mounted to turn about an axis passing through the middle line of the ruled surface. The spectrum is projected by the same lens upon a horizontal arc of forty feet radius, and is observed a little to one side or above the slit. The spectrum will not be normal throughout its length unless the radius of projection be kept constant. I think this had better be provided for by employing two lenses of crown glass, the one nearer the grating fixed, the other movable, than by the use of a corrected lens, to avoid the absorption of flint glass in the achromatic combination.

More or less absorption when glass is used is unavoidable, and this, with the variation of the focal plane of the lens for light of different wave-lengths, constitutes the most serious defects of the apparatus—defects which are avoided in the Rowland instrument. However, compensating advantages are not wanting. The Rowland apparatus integrates all impressions received at the slit. The ordinary comparison prism cannot be used with it, and the lower orders of spectra are too narrow to admit of convenient division at the camera; in fact, the spectra begin at nothing at the slit, and spread in a widening band as we move toward the higher orders.

The new instrument possesses the advantages of the analysing spectroscope. The spectrum can be made wide or narrow, or divided at the slit. A preliminary trial has given the following results:—A flat grating of 14,000 lines to the inch, and a ruled surface 2 by 1½ inches, was employed with a lens of 37 feet focus. The latter was placed close to the grating, and its spectrum observed near the slit. In the second spectrum b_1 and b_2 were fully an inch apart as projected on a screen, and D_1 and D_2 had a separation of 13 to 14 mm.

The excellence of the definition is shown by the fact that with an ordinary reading-glass of six inch focus, E was seen double, and 14 lines counted between D_1 and D_2. With this form of apparatus the amount of dispersion can be varied at pleasure by simply altering the relative distances of slit and camera from the grating, but in such a way that slit and camera shall occupy conjugate foci of the lens.

◆

PHOTOGRAPHS OF THE ELECTRIC SPARK.

It may be interesting to compare with photographs of lightning the reproductions given below of some photographs of the spark given by the Wimshurst powerful induction machine, which were taken by H. Trueman Wood at the Society of Arts and at the Royal Institute. The machine is capable of giving nine-inch sparks. Fig. 1 is a single spark of about eight inches in length. Fig. 2 shows a series of six shorter sparks, allowed to impress their images in succession on the sensitive plate, the lens being kept open. Fig. 3 is the brush or continuous discharge, obtained when no condenser is used. The luminosity of this is very feeble, as may be judged from the fact that an exposure of half-a-minute was required. Fig. 4 shows rather a curious effect, the spark perforating a glass plate.

For the sake of comparison, fig. 5 is added. This is a view of the spark as given in the text-books. It appears to be of very doubtful authority.

The spark from an induction coil shows the same characteristics as that from the Wimshurst machine, but is of a much feebler luminosity, and, consequently, less easy to photograph well.

In further pursuance of the subject, we may quote from a recent article by G. M. Hopkins, on "Autographs of the Electric Spark," which appeared in the *Scientific American*. He says:—

> Electricity of very high tension, when discharged on the surface of a body having very low conductivity, forms a luminous aborescent image, showing the path of one or more of the sparks resulting from the discharge. The erratic course taken by the spark may be due to the compression of air in the path of the discharge, or to the superior conducting power of some portions of the conductor, or to both.
>
> The autographic record of such a discharge is sometimes found on the bodies of persons struck by lightning, the tree-like appearance of the marks giving rise to the erroneous notion that the lightning in some way photographs upon the body the image of the trees in the vicinity of the catastrophe.
>
> Doubtless, the same marks might be produced upon the body by the discharge of a Holtz machine or a large induction coil;

but this is an experiment for which it would be difficult to find a subject.

Fig. 6 is an accurate copy of a photograph taken from the arm of a boy who has been struck by lightning. Here the marks bear a striking resemblance to some forms of vegetation.

The writer, in striving to secure an autographic record of high tension electrical discharges, tried a large number of films before finding one sufficiently delicate to be impressed by the discharge, and at the same time having enough firmness to prevent it from being blown away by the spark. A thin film of smoke on glass, fixed by means of alcohol, yielded the first results; but the difficulty of saturating the film with alcohol without destroying it was considerable. Finally, a smoke film formed on glass previously coated very slightly with kerosene oil was adopted as the most practicable. The glass was prepared for smoking by smearing it over with the oil, then removing all but a trace, then smoking it lightly over a very small gas jet or over a candle.

The glass plate thus prepared was arranged between the terminals of the induction coil, at right angles to the terminals, so that the discharge might be directly against the smoked surface of the glass, as shown in fig. 7.

The coil employed was capable of yielding a 1½ inch spark, and the pointed terminals were separated ½ inch. A single spark, or what appeared to be such, from the negative terminal of the coil produced upon the film a spot like one of those shown in fig. 8. These spots, to the unaided eye, appear like small holes through the film; but microscopic examination shows them as composed of a large number of very crooked lines cut out of the smoke film, and strongly resembling a tuft of wool. Fig. 9 shows a figure produced by a succession of discharges. These figures indicate the splitting up of the discharge into several branches. It might at first appear that the structure of the film would have some influence on the direction of the discharge, and, consequently, on the character of the lines; but the other markings shown are so characteristic, and so evidently independent of the structure of the film, that it seems almost certain that the nature of the film had very little to do with the direction taken by the spark.

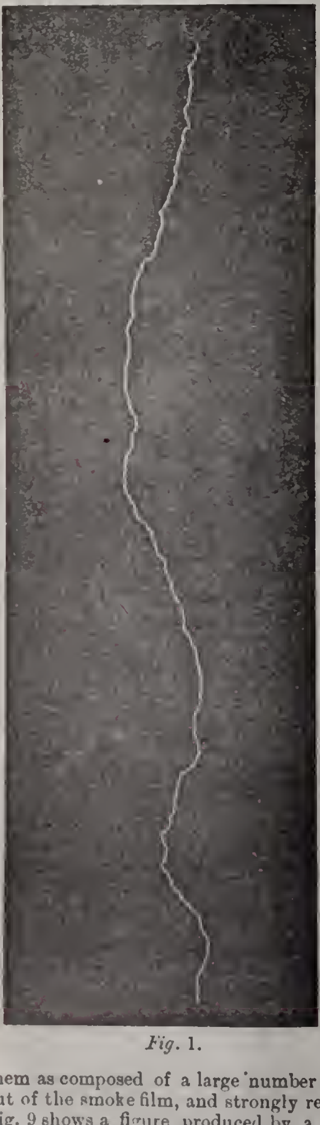
Fig. 1.

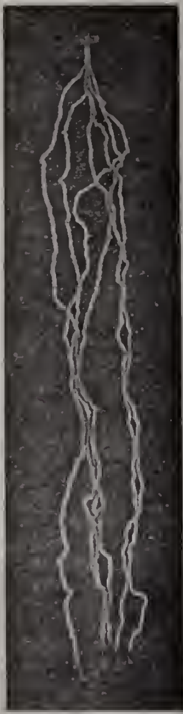
Fig. 2.

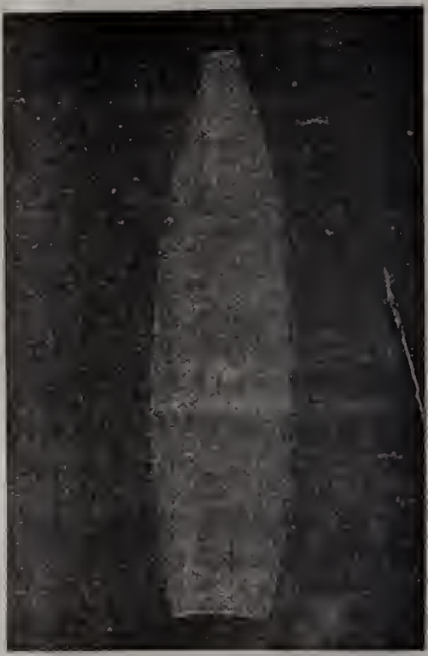
Fig. 3.

Figs. 8 to 12, inclusive, are photo-micrographs of various marks produced in the manner described, taken under a magnification of twenty diameters, and the engravings of their electro-autographs are produced by photo-engraving, without any additions or modifications whatever, so that faithful reproductions of the original work done by the electrical discharge are presented herewith. The figures numbered 8 to 11 were produced by the discharge from the negative terminal of the coil, while the marks shown in fig. 12 were made by the discharge from the positive terminal.

The sagittate form of the larger marks in fig. 10 are produced by a heavier discharge, and are suggestive of exceptional origin. The sagittate and bird-like forms shown in fig. 11 are of rare occurrence, but they are of substantially the same nature as those shown in fig. 10. Figures resembling these have been seen in vacuum tubes, and sketched by De La Rue. Reproductions of some of his drawings are given in fig. 13. 1 in this cut shows striæ in which each section resembles an arrow head, the points always extending toward the negative conductor. 2

shows the tendency of striæ to become conical. 3, 4, and 5 show sagittate forms similar to those shown in the autographs, figs. 5 and 6, but the images of them vanished when the current ceased. 6 in fig. 8 shows forms taken by the discharge from the positive terminal in a vacuum tube, which have substantially the same appearance as the marks shown in fig. 12.

Two peculiarities are noticed in the marks in fig. 12, one being the longitudinal grooves in each mark, the other the evidence of the ricocheting of the spark.

Fig. 4.

Fig. 5.—A questionable representation of the zig-zag spark.

Fig. 6.—Marks produced by lightning.

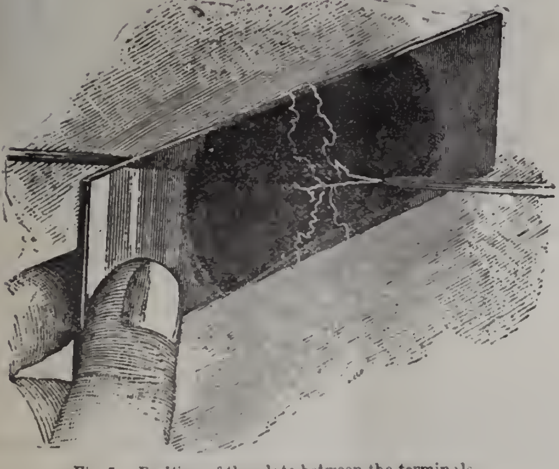
Fig. 7.—Position of the plate between the terminals.

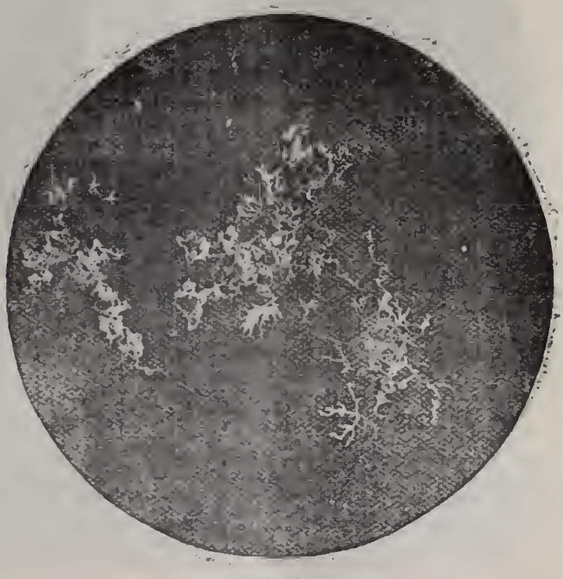
Fig. 8

De La Rue says: "The gases, in all probability, receive impulses in two directions, at right angles to each other, that from the negative being the more continuous of the two." The autographic records here shown seem to bear out this theory, since all of the arrows have lateral enlargements, and point toward the negative.

The longitudinal groovings of the marks made by the sparks from the positive terminal are suggestive of a multiple discharge.

Some time ago we received from E. B. Vignoles a very interesting photograph of lightning taken by H. Schleusner and himself. This we reproduce on the original scale, and we quote the following particulars from the letter of Mr. Vignoles :—

Sir,—The photograph was taken on Wednesday evening, May 26th, 1886, at about 10.30 p.m., by Mr. H. Schleusner and myself. The storm was due south of here, at a distance of about three miles. Though there was little forked lightning, we determined to have a shot at it, and went to a window where we exposed a "Nys" plate (6½ by 4¾), and waited. After several small displays of sheet and one of forked lightning (of which the extremity falls on the left hand upper corner of the plate), there

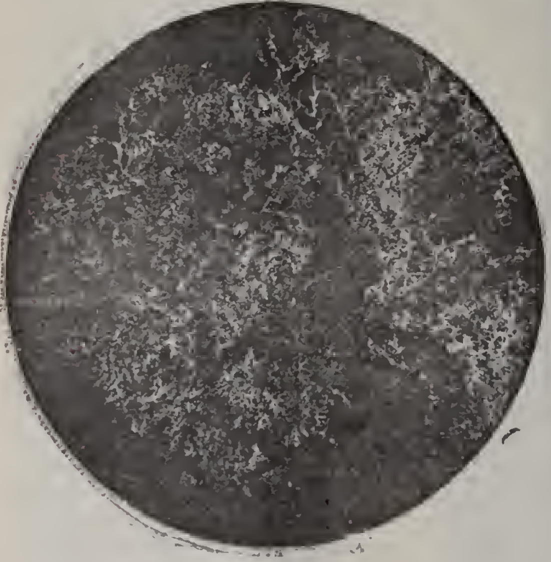
Fig. 9.

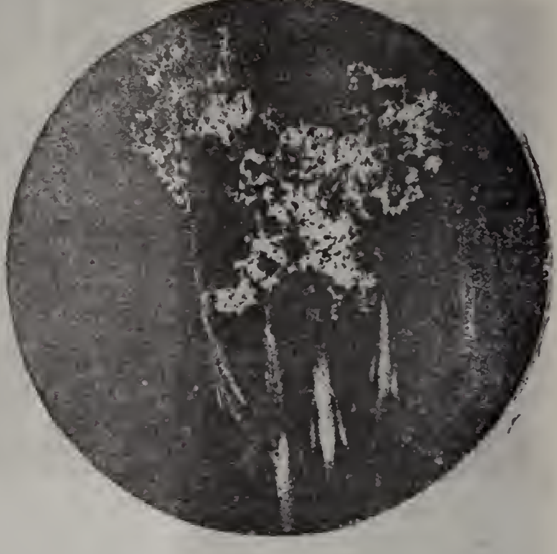
Fig. 10.

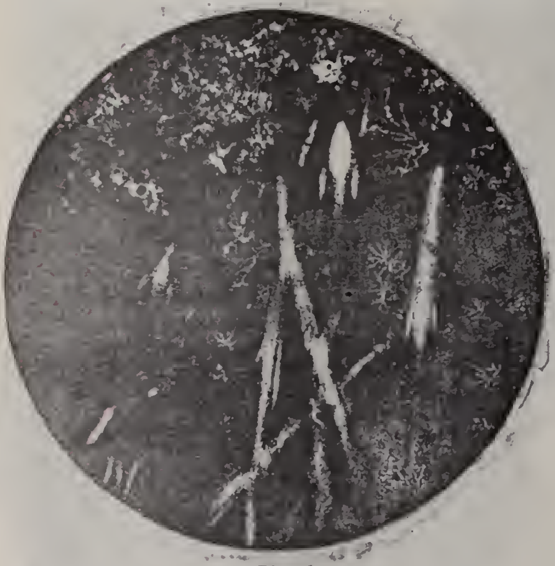
Fig. 11.

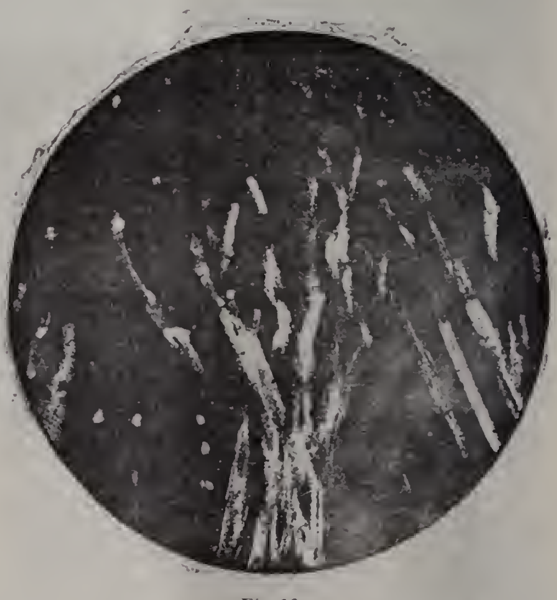
Fig. 12.

came, after only ten minutes' waiting, the three vertical ribbons, followed almost instantaneously by the gorgeous flash you see, right in front of the camera, as if made to order. The lens used is a Steinheil antiplanat.

* * *

THE LATENT OR DEVELOPABLE IMAGE.

BY CHAPMAN JONES.

As I have already ventured to indicate that the inferences concerning the developable image that Carey Lea has drawn from his interesting experiments do not carry conviction with them (page 419), I beg to make a few remarks upon his further statements as given at page 449.

More than a hundred years ago Scheele proved beyond a doubt that chloride of silver lost some of its chlorine when exposed to light under certain conditions. Similar observations have since been extended to the bromide and iodide of silver, which were not known to Scheele, but further than this, very little advance has been made, the added information consisting chiefly of a few negative results. No one has been able to satisfactorily demonstrate the existence of any definite sub-salt of silver, whether produced photographically or chemically. If chloride of silver loses chlorine when exposed to light, the residue must obviously contain a less porportion of chlorine (this much we owe to Scheele), but no one has yet prepared a chloride or oxychloride of silver of definite composition containing less chlorine than the well-known chloride, AgCl. Carey Lea's experiments go far to show the probability that what one hundred years of investigation has failed to do, the next hundred years will also leave undone.

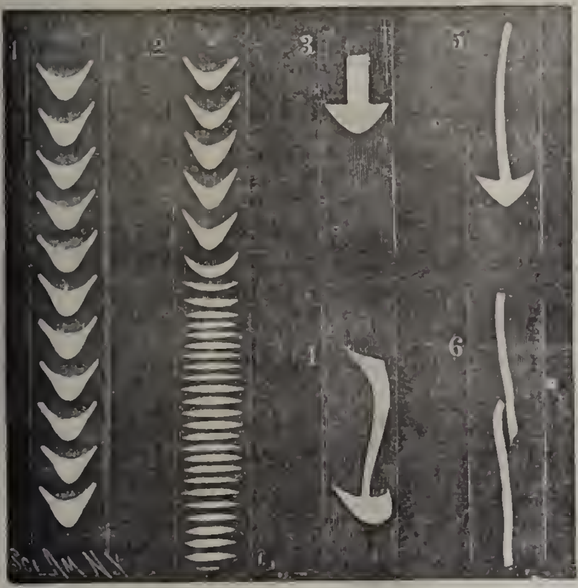

Fig. 13.—Figures formed by the electric discharge in vacuum tubes.

The expression "sub-salts," as used by Carey Lea in his last communicaiion, is open to two interpretations. In its strictly chemical sense it refers to bodies that have only a hypothetical existence; but it may be, perhaps, loosely used to indicate the residual products of silver salts that have lost a part of their halogen or its equivalent. The "important conclusion" in the last communication from Dr. Lea, "that all such silver silver salts must be capable of forming sub-salts, else the image could not be transferred," may be, therefore, a statement altogether premature, and entirely unsupported by facts; or it may mean that the silver salts referred to (citrate, benzoate, tartrate, pyrophosphate, &c.) must be capable of forming compounds analogous to what Dr. Lea elsewhere calls "photo-salts."

Taking the last interpretation as the one that is not obviously without foundation, and for the moment grant that the developable or latent image consists of photo-salts,[*] this important conclusion is only valid when we allow that no property is transferable, except a change in chemical composition. This, of course, no one can admit.

As I pointed out in my previous communication that Carey Lea's experiments were really valid arguments against his inferences concerning the developable image, so, curiously, the only experiment bearing upon the subject in his last communication is also, I submit, a good and valid argument against the conclusions that he states. He finds that the salts of silver mentioned, other than the haloid salts, may have an exposure varying from three seconds to four hundred seconds, and that the effect is uniform when treated with a haloid acid, washed, and developed. Now, if a definite chemical action is continued, the products of that action must accumulate. If the action of light stops at the end of three seconds, there must be a cause for it; but if, on the other hand, the action of light continues, Dr. Lea's experiments show that its continued action is not transferable.

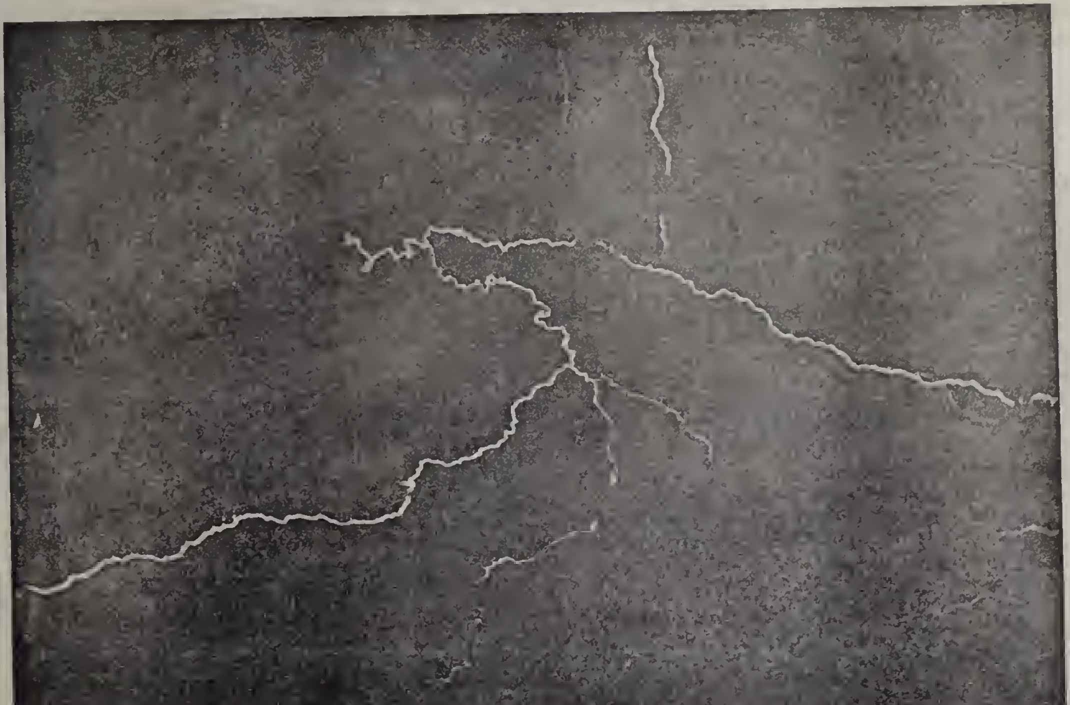

Fig. 14.

It appears that one or other of these two alternatives must be true, and in either case we have real experimental proof that the action of light in producing the developable image is not of the nature of a mere decomposer of the silver salt.

---

[*] I have previously endeavoured to show that the experiments indicate rather that the developable image cannot possibly consist of photo salts,

While thus endeavouring to show that Dr. Lea's conclusions concerning the developable or latent image are altogether without foundation—I mean, as altogether without foundation as any other theory that has ever been put forward—I have the strongest conviction that the results of his experiments are of the greatest intrinsic value, and that some of them do add to the very little we know of the subject. His theories may answer his present purpose as working hypotheses, but he does not seem to advance them as such. Indeed, if he had, it would have been open for anyone to attempt to show their unworthiness.

FRENCH CORRESPONDENCE.

French Photographic Society—International Exhibition in Florence — Photographic Excursion Society—Society for the Study of Photography as applied to Industrial Reproduction Processes.

French Photographic Society.—The last gathering of this Society suffered from the recent hot weather, which has driven the greater part of the Parisian public into the country. Communications were few, and, moreover, not very interesting. M. Layard indicated a method of photo-sculpture, of which we humbly admit we understood nothing, but which appeared to us to recall, with less clearness, the method of M. Wilhem. We don't know whether anything good or useful may be anticipated from photo-sculpture, but in our opinion it is an application rather theoretical, than one capable of being put seriously into practice. We do not wish to say anything disagreeable to anyone, but it is difficult to consider this pretended process of sculpture by photography as anything else but a catch-penny. It appears to us that there are enough really important applications of photography, without losing our time and labour in the search after processes which are incapable, do what we will, of ever producing anything good. A discussion took place upon the best system to be employed in order to prevent the danger of exposing the same plate twice, a mistake which is frequently made by absent-minded people, amongst whom we must class ourselves. M. Davanne proposed to make use of a slip of gummed paper, fastened across the line of union of the shutter and the frame of the dark slide. This means, in fact, appears to be one of the greatest simplicity, but it seems to us that a better method would be to make the shutter automatically work an index, which should fasten the shutter itself as with a bolt. This would be neater than a band of gummed paper on the dark slide, and, moreover, the shutter would be closed in such a manner that it could not be opened, even accidentally. This precaution is not excessive, considering that it often happens that one exposes a second time a plate which has already received an impression. Such a mistake cannot occur if, when closing the shutter after the exposure, an automatic locking movement is made. Makers of apparatus will have no difficulty in fitting up a very simple combination which will realise this desideratum. Upon the proposition of M. Bordet, the Society decided that, following the example of the Physical Society, it would each year hold an exhibition of the apparatus and of the experiments presented at its monthly meetings. The idea appears excellent. This exhibition will constitute a sort of practical and living *résumé* of the important doings of the Society. The French Photographic Society is, moreover, on the road of progress; the number of its members does not cease to grow; its resources, without being powerful, are prosperous. It is, then, time to enter upon a path of improvement called for, or, at the least, desired, by the greater part of its body.

International Exhibition in Florence.—Although we have here to do with matters foreign to France, we may be permitted to say a few words on the subject of an exhibition which it has been given to us to see in detail, since we assisted at it in the capacity of a member of the jury, and afterwards as honorary president of the said jury, a highly flattering distinction, for which we are very grateful to our excellent colleagues of the international jury of Florence. An examination of this Exhibition shows that the industrial applications of photography have yet to make progress in Italy, where, however, very praiseworthy efforts are made with the view of creating a local production of all kinds of photo-mechanical impressions. Photo-collotype counts many adherents, of whom some—such as MM. Giulio Rossi, Armmenise, Pistoïa, &c.—almost rival the good operators of other countries in this process, Germany always excepted; for there collotype is practised in a superior and, up to the present, unrivalled manner. Photo-gravure in relief is practised with very great success by the house of Trèves Bros., whose exhibition of works of this kind is most remarkable. Of engraving in relief, but with half-tone, we have to cite the house of Turati, which, in this direction—the object of so many and often fruitless experiments—has reached a success worthy of being appreciated. The jury has, therefore, allotted to M. the Baron Turati one of its four diplomas of honour. We may add here that the others have been awarded to MM. Nadar, Giulio Rossi, and Carlos Relvas. Photo-gravure in intaglio of Italian origin (we speak here of photo-gravure in half-tone) is conspicuous by its absence. Very satisfactory experiments have been made in this direction at the Institute of Military Geography, but without producing, up to the present, sufficiently practical results. In this state establishment, and under the skilful technical direction of M. le Chevalier Granchi, photo-lithography on zinc, and photo-gravure in intaglio of line subjects (the process of General Havre), are cultivated on a very large scale, and in a remarkable manner. This is a very important service, and it tends to increase, so useful is it in military cartography. Woodburytype does not exist in Italy, where there is but little probability of its ever being introduced, seeing the small favour which this beautiful process enjoys in France and elsewhere. We believe we have had occasion to mention before, that we have in France only two photoglyptic establishments, in which, moreover, very little is done. This is on account of the necessity of mounting the prints, and editors prefer impressions obtained on paper which can be bound in the book, without requiring to be mounted. It is our full conviction that photoglypty will have no complete industrial success until it is applied to quite a different purpose. It would serve, combined with colour, to decorate objects of cabinet work and other nicknacks, and it is surprising that there is not as yet an *atelier* devoted to this special purpose. We are at present engaged in having some models of this kind prepared, so as to make our idea better understood, and to show that an industrial use may be made of it. The speciality in which Italian photographers excel is that relating to the reproduction of monuments and works of art, and even here they have not made use, up to the present, of orthochromatic plates. They are indebted to long, tedious, and naturally expensive retouching, to help out the insufficiency of ordinary gelatino-bromide plates. There is here great progress to be realised. Many among them have it in mind; notably, M. Carlo Brogi, the director of one of the most important photographic houses in Florence. The positive prints in these houses are produced upon albumen paper, none of the photo-mechanical processes being able to satisfy these practitioners, principally on account of the number of impressions which any mechanical printing implies. They do not require a stock of each reproduction, but only a few proofs, knowing that they can print others in accordance with their requirements as they may arise. As for impressions giving images of assured permanence, they are not currently used in any of the large publishing houses. Platinum prints require nice management, the special paper not being always in good condition as to freshness. Carbon prints yield too uncertain results, and prints on Eastman's paper are scarcely known. From all this it results that albumen paper reigns supreme, and everything leads us to believe that it will do so for a long time. The desire to do better must accommodate itself to practical and industrial possibilities. It is this which for a moment stops photographers, who are nevertheless eager for progress, and who would not allow the first occasion which offers itself to escape them for breaking with the odious routine from which they would have long wished to free themselves. This exhibition has given rise to an Italian photographic society, of which M. le Comte Bastogi—a very rich amateur in photography—is the president. Thanks to this association, the relations of the Italian photographic world with their brethren in other countries will be more frequent, the emulation of experimenters will be better sustained, and the progress accomplished better marked; and we are happy to have assisted at the birth of the Society whose influence upon the expansion of all the applications of photography in this beautiful country of the arts and of light, promises to be so great.

Photographic Excursion Society.—This Society has just been constituted under the presidency of M. Gaston Tissandier, the learned and sympathetic director of *La Nature.* The object of the Society is to assemble amateurs in photography, and to develop, by excursions, items of practical knowledge which are wanting to beginners. Guided by more experienced colleagues they may rapidly pass over the most difficult stumbling-blocks of photographic initiation. M. Albert Londe has been the principal architect of this edifice, of which he is the vice-president.

Society for the Study of Photography as applied to Industrial Reproduction Processes.—This Society, according to its prospectus, is founded by the hearers of Professor Vidal, for the purpose of drawing together the bonds of brotherhood which already unite them; to facilitate the obtaining of all instructions relating to the graphic applications of light; and to encourage, in proportion to its means, all those who desire to give themselves up to this kind of work, and who wish to be united amongst themselves. This Association—to which we have only very indirectly contributed by efforts made in the endeavour to render our course of instruction useful and interesting—is a new proof of the spirit of study and emulation which reigns among adepts in photographic art. Dr. Judee is the president of this Society, which has been good enough to award to us the statutory title of honorary president.

Leon Vidal.

MOUNTING PHOTOGRAPHS FOR BOOK ILLUSTRATIONS.

The binder is often called upon to insert photographs in books as extra illustrations; but does he ever mount them to his own or his client's satisfaction? It has been said over and over again that a photograph cannot be mounted so that it shall lie quite flat; this "cockling" of the mount, be it of paper or cardboard, has hitherto been a constant bugbear to the binder. Here are a few hints that may guide him as to the proper means of mounting.

A silver-print photograph should never be placed on a very white mount, because the high lights of the print are never pure white, and a bright white margin round the print spoils its beauty by killing its delicate half-tones. Lay the print on paper of various tones, and select the tint that harmonises with it best. Next, pay attention to the mixture you use to fasten it; let us call this the mountant. This cannot be too pure.

If you use starch, which is employed, we believe, more than any other paste, make it fresh every day, and in this way: take a teaspoonful of best starch in a large cup, add just enough cold water to break it up, but don't put in more than is quite necessary, pour boiling water on it, stirring the while, until it is quite transparent; when cold it may be used.

Or, if you wish to use paste, take a teaspoonful of corn-flour, beat this well up in a teacupfull of water till it is quite smooth and there are no lumps; place this in a porridge saucepan (that is, a double one), and let it boil, stirring it continually; it will turn to a delightfully thin and transparent paste that will be easy to work with and very adhesive. Gelatine dissolved in water—say a half ounce to a teacupful—is also a very good mountant. It must be of the best quality, and ought to be used hot. The preserved paste sold by the London Paste Company is very good.

Now for the difficult part of mounting. We will give three methods—

1. After trimming the print all round, moisten it slightly (the object being to have it limp, without stretching it), by placing it between sheets of damp paper over night, and it will be about right next morning. Damp the mount, also slightly, paste your print very carefully all over (using no more paste than is just necessary), lay it carefully on the mount, cover it with a piece of clean paper and rub it down well, and then place it in the standing-press, between pieces of blotting paper, and allow it to dry under pressure. It may be perhaps necessary to take it out of the press and change the blotting-paper. If all this be done properly, the photograph and its mount will lie quite flat.

2. Another plan is to paste the back of the print all over, and allow it to dry; damp the mount, lay the print on the damp mount, and pass them through the rolling machine, or place them in the standing-press, under strong pressure. For this method we have to thank Mr. A. Cowen, a well-known photographer.

3. Take a piece of lithographic stone or a thick piece of glass; glue this all over with the gelatine, place the photographic print quickly down on the glued stone, rubbing it smartly all over, then pick it up and lay it down on the mount. All these actions must be rapid, and if done properly by this method, a photograph may be easily mounted even on thin paper without cockling.

There are other methods, but with any one of these a binder may easily, cleanly, and properly mount a print of any size; the chief object being to get the print on to the board or mount before it has any time to stretch. As a final warning, see that the mounts are not boards made from wood pulp.—*The Bookbinder.*

Review.

The A B C Guide to the Making of Autotype Prints in Permanent Pigments. By J. R. Sawyer. Cloth; two illustrations; price 2s. 6d. (*London,* 1887: *The Autotype Company,* 74, *New Oxford Street.*)

In this handbook of a hundred pages, the author gives such directions as will enable any person of moderate ability to become a carbon printer—it being understood that the person of moderate ability must really give his mind to the task before him.

Introducing the subject with a short history of the carbon process, the author passes on to the tissue and the mode of sensitising it, and from this the beginner is led through the single transfer process, after which the more complex modes of carbon printing are considered.

The general get-up of the book is neat and attractive; binding, print, and paper, being all excellent, while the admirable child portrait in red chalk, which serves as a frontispiece, deserves special notice.

Notes.

The Photographic Society, in the last number of its journal (dated June 24th, but not to hand till July 15th), appears to commit itself definitely to the calling of a gelatino-bromide print a "*Permanent Contact Print.*" Such is the description of a gelatino-bromide silver print which is issued with, and forms part of, the journal. Many of our readers have known instances in which gelatino-bromide silver prints have rapidly faded, and we had supposed that the calling of such prints "permanent" was confined to the commercialist who expects to gather more money in proportion as such prints are held in higher estimation.

Lesseps is one of the astutest of men. As all kinds of rumours have been afloat concerning the progress of the works in connection with the Panama Canal, he had a series of photographs taken, and distributed copies among the shareholders who were present at the meeting last week. Seeing was believing, as, of course, photography always tells the truth. The photographs answered the purpose of reassuring the shareholders, but they must have been as convincing a proof of the ultimate success of the scheme as some photographs of gold-mining machinery which we saw the other day were, that gold would be found in the mine in question.

Under some circumstances, the exhibition of a photograph of an article, instead of the article itself, may be construed into an insult. We are told that the authorities of the Kempton Park Race Course, by showing a photograph of the Victoria cup, valued at £500, instead of the cup, have cast a slur upon the honesty of the people admitted into the enclosure. Anyway, a semi-sporting print has it that the act "showed an unjustifiable lack of confidence in the members of the club."

The new edition of the "Autotype Manual," noticed on another page, is rather a new book by J. R. Sawyer, than a fresh edition of the old manual. It forms a practical guide, bringing permanent photography within the powers of any photographer who sets his heart on the task of mastering carbon printing. Carbon printing is certainly not so easily mastered as silver printing, but it is well worth the labour involved in learning. Many have failed because they have underrated the labour required to learn; and, as we wish to see the carbon process widely and successfully employed, we emphasise the fact that he who lightly undertakes it, and consequently fails, brings it into bad repute as a difficult process beset with pitfalls. He who would be a successful carbon printer must understand that he is about to undertake something which involves great care, watchfulness, and thought; but when he has learned, he will not regret the expenditure of time and thought.

From New York we learn that a considerable portion of the store of Anthony and Co. was burned out on the night of the 14th inst., but we understand that efficient arrangements have been made for carrying on business until the damage can be made good.

Davanne, the well-known French chemist, has offered a prize of a thousand francs for a new photographic plate to embrace the advantages of both gelatine and collodion. The principal conditions to be complied with are great simplicity in the operations, combined with the greatest sensibility. All processes in competition should be fully described, and the descriptions forwarded to M. Davanne, at the office of the French Photographic Society, 20, Rue Louis le Grand, Paris. Negatives and prints should accompany the descriptions, and the last day for receiving processes in competition is December 31st, 1888.

Photographers may be interested in knowing that Zola has included photographs in his realistic delineations. In one of the earliest of his novels, he makes the chief character of the book, a young woman, examine some photographs of well-known Parisian beauties, and express much satisfaction in discovering in their faces by the aid of a magnifying glass some unknown wrinkles, rough skin, and cavities imperfectly filled up with rice powder. Can this bit of realism have anything to do with the mania for retouching, which has of late years been carried to such extremes? The consciousness that the lens would reveal defects not ordinarily visible must have made many ladies fight shy of photography; hence the fashionable photographer had no alternative but to try and convince his fair clients that he could compete with the artist's flattering brush.

Whether Zola had indirectly any influence on retouching or not, it is pretty certain that the use of the magnifying glass has compelled the production of an evenness of texture which will stand this test. We remember a few years ago calling upon a photographer who did his best to be conscientious, and finding him exceedingly irritated. "Look here," he exclaimed; "this is the kind of thing we have to put up with now-a-days. You see this vignette: is there anything the matter with it?" It was what anybody would call a good photograph, and we said so. "Exactly," replied the irate photographer. "This proof the sitter has just called to see before ordering a quantity. Instead of looking at it as you have done, she pulled out a big magnifying glass, and after going over the surface, shuddered, and exclaimed, 'Oh! how shockingly coarse. It is so strange you English photographers cannot make such good portraits as are produced in Paris or Vienna; but I suppose it is the light.' Now what are we to do," added our friend despairingly, "if our work is to be looked at under the microscope before it is approved?" And there was certainly reason in the question.

The *Century* magazine has purchased the right of reproducing certain of Muybridge's 20,000 new instantaneous photographs of men, women, children, birds, and animals, in the production of which, under the auspices of the University of Pennsylvania, he has been engaged for the last four years.

The irrepressible amateur, eager for new worlds to conquer, or, rather, to "take," does not sit down on his portable camera and weep. Oh! dear, no; he rather looks about him for fresh fields for his indefatigable enterprise; and thus it is that he, with his apparatus, is now becoming a generally recognized accessory of the lawn tennis court of the period. Armed with a lavish supply of plates, there is nothing the enthusiastic amateur is not ready and willing to take, unless it be, indeed, a hint to cease from his labours and depart.

As a rule, however, the photographic amateur is welcome, for does he not, by his patient and longsuffering efforts, invest local players with a lustre hitherto only enjoyed by the Renshaws, the Dods, and other players of cosmopolitan fame? To be photographed in the act of serving one of her "twisters" is, for the local lady champion, fame indeed; whilst it adds to the reputation of the suburban lawn tennis hero for it to be known that the enthusiastic amateur has positively spoilt two dozen dry plates in vainly attempting to secure an instantaneous negative of one of his Renshaw-like "smashes."

At the worst, too, even if his efforts with more animated subjects have resulted in failure, the most feeble amateur cannot well fail in securing a satisfactory "still-life" group, including the pair of plated claret jugs, the cut-glass biscuit-box, the electro coffee-pot, and the silver challenge cup, which constitute the prizes at the local tournament. He has been even known, has the feeble amateur aforesaid, to devote his time and patience to a realistic portrait of the local champion's favourite racket, or a study of the umpire's back. Lawn-tennis players as a body seem in fact to welcome rather than to resent the presence of "a chiel among them takin' negatives," and as the actual dangers of the situation are comparatively trivial as compared, for instance, with those of an amateur photographer endeavouring to secure negatives on a cricket ground—when Ulyett is bowling, say, or A. N. Hornby has begun to "hit out" all over the field—it is likely that the photographic camera will continue to be a common object of the lawn-tennis court until what we may call the photographic possibilities of the latter have been thoroughly exhausted.

The *Court Journal*, in remarking upon the uniform which the Prince of Wales wore in his capacity of Jubilee Admiral at the naval review, says this makes the fiftieth uniform which the Prince is entitled to wear on State occasions, and suggests that the photographs of the whole wardrobe should be published, as they would be "extremely interesting and popular." No doubt; but the carrying out of the plan is beset with difficulties. Is it implied that the uniforms shall be photographed alone, or with the Prince inside them? If the former, the photographs would be strongly suggestive of the "left-off wearing apparel" establishment. If the latter, we should very much like to know how his Royal Highness is to get into the State dress which was made for him when he was twenty-one, or even that which was made for him two years after. A dummy figure of the requisite size might be utilized, but we doubt whether such photographs would be either "interesting" or "popular." Besides, the whole series would be sure to suggest to the Prince such uncomfortable reflections as to his departed slimness and to his increasing baldness, that he could never look upon them without a shudder. We greatly fear that the notion of the *Court Journal* is impracticable.

A correspondent writes: "Mr. F. Galton's photographic silhouettes remind me of an amusing incident which happened a few weeks ago, of which I thought nothing at the time—I mean from a scientific point of view—but which, after seeing Mr. Galton's experiments, I think might be utilised. I was at a summer outing of a certain society, and the dinner took place in a marquee, one side of which was strongly lighted by a six o'clock sun. When the festivities were nearly over, and everybody had time to look about, there was a roar of laughter at an impromptu galanty show, the actors in which were totally unconscious they were providing any amusement. Two of the waiters, who had each secreted half a bottle of champagne, had gone outside to enjoy their spoil on the quiet. Unfortunately, they selected the brilliantly-illuminated side of the tent, and their shadows, each with a bottle to his mouth, were thrown sharply upon the bright canvas. One of the company who never goes without his detective camera, immediately took a shot, and secured a memento which he treasures as one of the curiosities of photography. If Mr. Galton wants an easy method of producing silhouettes of the whole figure, would not some such plan as this be effectual?"

Manufacturers employ photography very largely in the production of their pattern books. It frequently happens that a large catalogue is issued in limited numbers for the trade, and as it is necessary to get these up very elaborately, the process is expensive. An issue of smaller size can, however, be produced at a small cost by photographing each page, and this answers very well for distribution in other channels. *Apropos* of photographing articles, no little skill on the part of the photographer is needed. It is not an easy thing, say, to photograph a dozen hats or a dozen boots, which must be arranged so that the light shall fall equally on each, and everyone be done equal justice to.

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ON PHOTO-MICROGRAPHY AND ITS VALUE IN BIOLOGICAL RESEARCH.

BY EDGAR M. CROOKSHANK, M.B. (LOND)., F.R.M.S.*
(Lecturer on Bacteriology, King's College, London.)

Though it gave me great pleasure to accede to the request of your secretary, to read a paper on photography in its relation to microscopical research, yet I must confess that I was oppressed with misgivings when I came to consider the exact title of my paper. And though it made me appreciate more and more the honour which had been conferred upon me in being asked to appear before your Society, it far from comforted me when I turned over in my mind the fact that my remarks would be addressed to a Society which represents the highest standard attained, either in this country or abroad, in the art and science of photography. However, I decided to lay before you the results, incomplete as the investigation has been, which I have attained, at intervals during the past two years, in endeavouring to depict by photographic means the minute organisms which have of late attracted so much attention.

You will therefore understand the scope of the paper, which I have expressed in the title, "Photo-Micrography and its Value in Biological Research."

You will observe that I adopt the term photo-micrography, though it is far from being euphonious. As you are probably well aware, photo-micrography is used in contradistinction to micro-photography. It is a term for which I am not responsible, for it has been in use for more than ten years, and it has been accepted for the reason that no better compound word has been suggested. It implies the production of an enlarged picture of a microscopic object, by projection of an image of the object through a combination of lenses upon a sensitised film. Thus it implies the production of a photograph of a minute object by any of the various kinds of photo-micrographic apparatus which have been from time to time in use. A photo-micrograph cannot be defined as the result obtained by applying the ordinary photographic camera to a microscope, because, as we shall see, we may obtain an enlarged picture of a minute object without the use of an ordinary camera, and, indeed, without the use of an ordinary microscope.

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* Read before the Photographic Society of Great Britain.

A micro-photograph, on the other hand, is by many restricted, and I think properly so, to imply a miniature picture obtained by photographic processes, which requires for its examination the aid of a magnifying lens or microscope. Such miniature pictures are familiar to us in the form of views fixed at the extremity of a pen-holder or needle case. They have also been used for weightier reasons than the amusement of the tourist, in the form of miniature despatches, which could be conveyed in time of siege by carrier pigeons.

Photo-micrography has for many years attracted the attention of numerous workers, both at home and abroad. I need only mention the names of Reade, Donné, Hodgson, Kingsley, Talbot, Wenham, Dancer, Draper, Maddox, Woodward, and Moitessier. Time will not allow me to describe in detail the various kinds of apparatus introduced by these investigators, or even to sketch the rapid progress which resulted, owing to numerous suggestions and improvements. Suffice it to say that some employed the microscope in a vertical position, with the camera superposed or fitted to the eye-piece end of the microscope tube. Others screwed off the tube from the body of the microscope, and adjusted in its place a camera of pyramidal form, the base of the pyramid being represented by the ground-glass screen. Others, again, dispensed with the ordinary microscope; the objective, stage, and mirror being adapted to the front of the camera, and provided with suitable arrangements for holding the object, supporting the mirror, and adjusting the different parts. In another arrangement, the ordinary camera was dispensed with altogether; the operating room, rendered light-tight, took the place of the camera, and the image was projected and focussed upon a ground-glass screen, which had a separate support. In fact, photo-micrographic apparatus varied from a very simple combination of the ordinary camera and microscope to a most complex piece of machinery.

The value of the results obtained in this branch of photography were very speedily appreciated. Photographs were not only employed for illustrating microscopical objects in histology, pathology, and crystallography, but they proved to be of value even to the most accomplished microscopist in the resolution of extremely minute objects, and in deciphering the markings of difficult test-diatoms.

Indeed, it is when we have to deal with the tenants of the invisible world—objects which can only be studied, or perhaps rendered visible at all by the very highest powers of the microscope, combined with the best method of illumination—that photography is peculiarly valuable; for, though experienced microscopists with a battery of objectives at their command may very readily convince themselves, without the aid of photo-micrography, of the form and size of these minute objects, and may in some cases, without much difficulty, illustrate the appearances with pen or pencil, still, it does not follow that such illustrations will be accepted by the sceptical, nor does it follow that even in the hands of the most experienced draughtsman such minute objects will be faithfully represented. Koch was one of the first to appreciate this; and, therefore, when studying the microbes associated with disease, applied photography to his researches, so that his representations of the varied forms of micro-organisms might not be attributed to any unintentional or intentional bias.

In 1877, the now famous micro-pathologist published a very instructive series from his negatives. These had been taken from microscopical specimens of bacteria, which had been made from blood infusions, or from artificial cultivations, by drying a thin layer on a cover-glass, and staining it. For the latter purpose, a brown or yellow dye was employed, and the resulting pictures, in most cases, were very sharp and satisfactory. Indeed, in two cases, the results amounted to photo-micrographic triumphs, for Koch succeeded in photographing the excessively minute mobile filaments, or flagella, with which some forms of bacteria are provided. To accomplish this, Koch stained the preparations with logwood, and then treated them with chromic acid, so that these delicate threads assumed a brownish coloration, which gave a distinct impression on the sensitised film. When, however, the same investigator attempted to photograph the bacteria under conditions which would not admit of their being stained brown, as in tissue sections, when they perhaps were necessarily stained red or blue, then disappointment resulted.

Precisely the same difficulties are encountered in photographing tapestry and paintings, and as these had been to a certain extent obviated by the use of eosin-collodion, the same method was adopted for photographing the bacteria stained with the more commonly used aniline dyes. By the use of eosin-collodion, and by shutting off portions of the spectrum by coloured glasses, Koch succeeded in obtaining photographs of bacteria which had been stained either red or blue; but, owing to the long exposure which was necessary, and the unavoidable vibrations of the apparatus, the results were so wanting in definition, that they not only proved unsatisfactory as substitutes for drawings, but did not in some cases give any evidence of what was to be seen in the preparations. Consequently, Koch stated that he would abstain from publishing photographic illustrations until he had the advantage of improved methods. However, in spite of these remarks, in 1881, a new series was published, as an illustration of what might be accomplished by photography. Here, again, the pictures of cover-glass preparations stained brown were excellent, but others, especially those taken from tissue sections, were far from satisfactory. The pictures of tissue sections, from the want of flatness of field, and from other causes, recalled in some cases rather the appearance of a photograph of the moon, or a map of a mountainous country, than a microscopical preparation.

Dr. Sternberg, of the United States, encountered the same difficulty in photographing red, blue, or violet preparations, but succeeded admirably with preparations stained brown. Thus the results of a large number of attempts to photograph the tubercle bacillus in sputum only ended in producing such extremely faint impressions, that anyone unacquainted with the object could scarcely form any idea of its form or minute structure, in spite of the accompanying explanation, and the closest inspection of the photograph.

Dufrenne, who also attempted to photograph the tubercle bacillus stained in the ordinary way with fuchsine and methylene blue, found that the plates were either uniformly acted on, or that the image was so faint, or so lacking in contrast, that they were useless for obtaining proofs on paper or glass.

The nature of the mounting medium afforded another drawback to photographing mounted specimens. Canada balsam, the most commonly employed mounting medium, was objected to, and other media far less convenient, such as a saturated solution of acetate of potash, were recommended. All these difficulties were, however, gradually overcome. In 1885, Dr. Hauser, of Erlangen, published a research on bacteria, which was illustrated with a series of photographs. The results of working with low powers, as well as with high powers, were given. The former afforded very successful demonstrations, and, though the latter in most cases presented defects, these appeared to be of a nature admitting of remedy, which rendered them equally encouraging; in fact, the defects were of such a nature that a more perfect arrangement of apparatus, or more careful management of the illumination, gave promise of eliminating them. Moreover, the preparations which had been photographed, though stained brown as recommended by Koch, had been mounted in the ordinary way in Canada balsam. Thus one objection was set aside. The prevalent idea that preparations must be stained brown was still a formidable obstacle, for this method was not applicable in all cases, and, further, one may be anxious to obtain photographs of preparations which, though admitting of a brown stain, may happen to have been stained previously by some other way, and to prepare them over again would entail loss of time and perhaps very considerable labour.

The credit of being the first to point the way out of this difficulty falls to Dr. Van Ermengem. This *savant* illustrated a report upon the etiology of Asiatic cholera with photographs of comma-baccilli, which had been stained red or violet. They afforded the first practical illustration of the value of the isochromatic plates in photo-micrography. These plates had been previously noted by Van Ermengem in 1884, and the successful results which he obtained led me to test their applicability for all kinds of preparations, and for the varied methods of staining which are employed in bacteriology.

I need hardly remind you of what is meant by iso- or orthochromatic photography. We are all familiar with the fact that in portraits blue or violet comes out almost or quite white, while other colours, such as yellow, are represented by a sombre shade, or even black. This failure in correctly translating colours is explained by the want of equality between the strength of the chemical and luminous rays. We all know that if the rays of the spectrum be projected upon a photographically sensitive surface, the most action is found to take place at the violet end. The violet and blue rays are more actinic or chemically powerful, while the yellow and orange have scarcely any effect. The dyes employed in staining bacteria give corresponding results; blue and violet give but a faint impression, yellow and orange a black picture. The same results were experienced in taking a photograph of an oil painting on an ordinary plate, and led to experiments being made which have resulted in orthochromatic photography. I have already referred to the use of coloured glasses. Later, it was found that if the sensitive plates were coloured yellow—*e.g.*, with turmeric—the blue and violet rays were intercepted, and their actinism reduced. In 1881 Tailfer and Clayton produced their well-known plates. The emulsion was stained with eosin, and it was claimed as a result that colours would be represented with their true relative intensity. A chromatically corrected plate, which was at the same time rapid, seemed to give promise of doing away with the difficulties which Koch encountered, and I, therefore, determined to try these plates with a view to photographing my preparations of bacteria without any reference to the colour of the staining re-agent which had been employed.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

10,247. William Goodwood Greenwood, Canal House, Drapers Fields, Coventry, for "An appliance to facilitate the accurate placing in albums of photographs, drawings, or scraps."—22nd July, 1887.

Patent on which the Ninth Year's Renewal Fee of £10 has been Paid.

2912 of 1878. W. B. Woodbury.—Producing designs upon paper, &c.

Specifications Published.

11,231. Benjamin Joseph Edwards, The Grove, Hackney, London, in the county of Middlesex, Photographer, for "A new or improved machine for cutting photographic and other glass plates."—Filed September 3rd, 1886.

Specification and drawings next week.

5,812. William Dyke Wilkinson and Frederick Fowler, trading as W. Dyke Wilkinson and Co., Stanley Works, Bradford Street, Birmingham, Manufacturers of Stamped Brass Foundry, for "An improved photograph or picture holder."—Dated April 21st, 1887.

A photograph frame or holder, whereby a photograph or picture may be preserved and exhibited. A flat piece of wood, metal, or other suitable material, is provided, by pressure or otherwise, with a recess capable of receiving the photograph or picture. To the back thus made, one or more screws are fixed, projecting from it at right angles. Over the photograph or picture a plate of glass is placed, in which holes are drilled for the said screws to pass through, and the glass is secured to the frame by means of nuts. The glass is also held at the bottom by hooks of metal provided with clips to pass through the back or frame, and clench on the other side. In order to support the frame in an upright, vertical, or inclined position on a table or shelf, there is attached a strut or leg by means of a connecting strap of soft metal or other material sufficiently pliable to allow of the strut or leg being adjusted at such an angle as to support the frame.

7790. Alfred Julius Boult, of 323, High Holborn, in the County of Middlesex, M.I.M.E., for "Improvements in photographic apparatus." Communicated from abroad by Henry Smith Crocker, of San Francisco, in the State of California, one of the United States of America, Merchant.—Dated May 28, 1887.

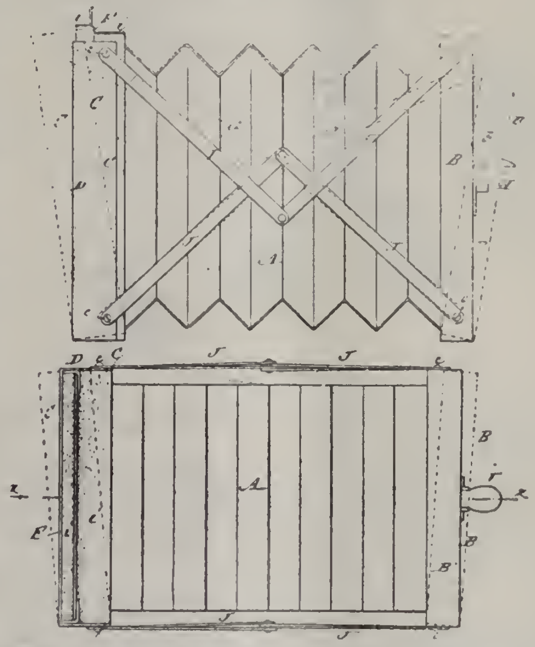
The pinhole camera: drawings and specifications next week.

7035. Johannes Gaedicke, of 74, Ritter-strasse of Berlin, Chemist, and Adolf Miethe, of the town of Potsdam in the German Empire, Chemist, for "An improved magnesium light for photographic purposes."—May 13th, 1887.

Articles on this invention appeared on pp. 346 and 350, and the full text of the specifications will appear next week.

Patents Granted in America.

364,864. Nicholas Schroder and Edward S. Adams, Brooklyn, N. Y. "Photographic camera."—Filed Nov. 4, 1886. Serial No. 217,982. (No model.)



Claim.—In a photographic camera, the combination, with the bellows or extensible body, of a back end frame, and a front end frame to said body capable of being independently swung or angled, and two sets of lazy-tongs, or crossed levers, all of like radius or length, and one pair of each set being connected with the back end frame at distant points, and another pair of each set being together connected to the front end frame at like distant points, substantially as and for the purpose or purposes therein set forth.

2. The within-described plate-holder, consisting of an inner frame *e*, card or sheet back *d*, bent over said frame or forming inner side and lower flaps *f*, and the upper inner flap *k*, having a velvet or soft flexible covering *i* applied to its surface, substantially as specified.

3. The combination of the back end frame, C, of the bellows, having a rear pocket D, and soft flexible covering *i*, applied to its upper portion in relation to the pocket, as described, and the plate-holder F, having inner side and bottom flaps *f*, and an upper flap *k*, faced with a soft flexible covering *i*, for operation in conjunction with the flexible covering on the upper portion of the frame C, essentially as herein set forth.

365,435. John R. Freeman, Lawrence, Mass., assignor to the Scovill Manufacturing Company, Waterbury, Conn., for "Photographic apparatus." Filed May 18, 1885. Renewed May 4, 1887. Serial No. 237,101. (No model.)

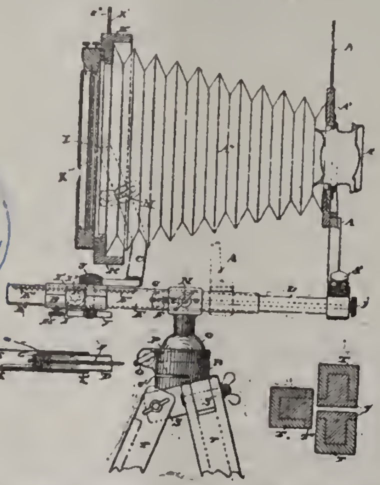
Claim.—1. In a photographic camera, the combination with a bar forming a main bed-piece, and a bar forming an extension bed-piece secured to the main bed-piece by a telescopic or sliding joint, of a plate-stand adjustably secured to said main bed-piece, and a lens stand adjustably secured to said extension bed-piece, substantially as shown and described.

2. In a photographic camera, the combination of a bed-piece consisting of a hollow bar or tube, an extension-bar sliding in said hollow bar and having a slotted end, and a wedge for expanding the slotted portion of the extension-bar and clamping

it at the desired point of adjustment, substantially as shown and described.

3. In a photographic camera, the combination, with a bar forming a bed-piece and provided with a suitable rack, of a focussing-slide provided with a pinion engaging with the rack, and a plate-stand secured by a vertical pivot-joint to said focussing-slide, all arranged and operating substantially as shown and described.

4. In a photographic camera, the combination, with a bar forming the bed-piece, of a focussing-slide carried by the bed-piece and adjustable thereon, and a plate-stand secured to said focussing-slide by a vertical pivot-joint, substantially as shown and described.



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5. In a photographic camera, the combination with a bar forming the bed-piece, of a focussing-slide carried by the bed-piece and adjustable thereon, and a plate-stand attached to the focussing-slide by a pivot-bolt, around which it can be rotated and clamped at the desired point of adjustment, substantially as and for the purpose set forth.

6. In a photographic camera, the combination, with a bar forming a bed-piece, of a focussing slide adjustably attached to said bar, carrying the plate-stand and provided with a lateral projection, similar in cross-section to the bar, and a removable lens-stand adapted to be clamped to the bar or projection, substantially as and for the purpose shown and described.

7. In a photographic camera, the combination, with a frame having a suitable groove, of an elastic tube secured in said groove, and forming a light-tight joint between the removable parts of the plate-frame, substantially as shown and described.

8. The combination, with a clamping-vice secured to a suitable stand, of a removable bar, forming the bed-piece of a photographic camera, adapted to be grasped by the jaws of the vice, and capable of adjustment longitudinally and at any vertical angle, substantially as shown and described.

9. In a photographic camera, the combination, with the bar forming a bed-piece, of a clamping-vice for holding said bar, and secured to the camera-stand by a ball-and-socket joint, substantially as shown and described.

10. In a photographic camera, a vice for holding the bed-piece secured to the ball Q, mounted in the socket R, having the slot o′, and provided with the clamp O, substantially as shown and described.

11. In a photographic camera, a vice for holding the bed-piece secured to the ball Q, mounted in the socket R, and having an elastic packing secured in the groove P, and provided with the clamp O, substantially as shown and described.

12. In a photographic camera, the combination, with the bar forming a bed-piece, of a U-shaped stand, C, for supporting the rear end of the camera-box, having its lower corners bent forward, as described, and adjustably secured to the bed-piece, substantially as set forth.

13. In a photographic camera, the combination, with a bed-piece consisting of a bar, and an extensible part secured thereto by a sliding joint, of a plate-stand of U shape supporting the rear end of the camera, and adjustably secured to said bed-piece, and another U-shaped stand supporting the forward end of the camera, and also adjustably secured to said bed-piece, substantially as specified.

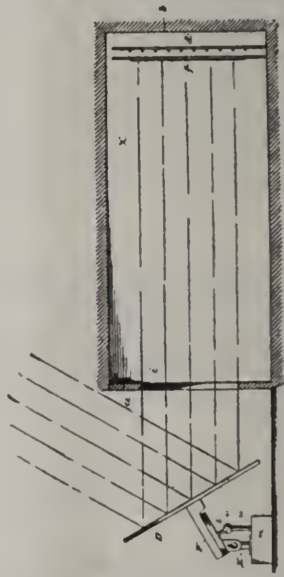
14. In an extension-back for photographic cameras, the combination, with a rear frame l, and bellows X, of a forward frame m, provided with a rabbet p'', surrounding and partially inclosing the rear frame of a camera-box, substantially as shown and described.

15. In an extension-back for photographic cameras, the combination of a rear frame l, forward frame m, and bellows X, with the independently-adjustable connecting-rods n, substantially as shown and described.

16. In an extension-back for photographic cameras, the combination of the rear frame l, connecting bellows X, forward frame l, and clamps o, with the rods n, pivoted at one end to the rear frame l, and removably secured in the clamps o, substantially as and for the purpose shown and described.

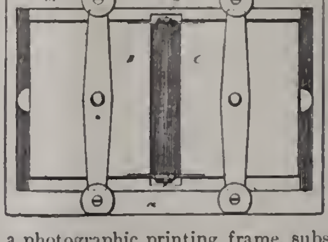
17. In a sighting device for a photographic camera, the plate k^3, removably secured to the rear frame and provided with the eye-hole k^4, in combination with the frame A^4, removably secured to the forward frame, substantially as and for the purpose shown and described.

365,897. John Baynes, Bronxdale, assignor of one-fourth to Lockwood de Forest, Oyster Bay, N.Y., for "Photographic apparatus."—Filed December 31, 1885. Serial No. 187,228. (No model.)



Claim.—The combination, with an apartment containing supports for pattern-plates and objects to be operated on by light rays, of a mirror arranged to receive the direct rays of the sun and to reflect them in parallel lines through the pattern-plates, a support for holding and guiding the mirror, and a motor for moving the mirror to maintain it in fixed relation to the sun's rays, substantially as specified.

366,060. Leo F. Adt, Waterbury Conn., for "Photographic printing frame."—Filed February 28, 1887. Serial No. 229,131. (No model.)



Claim.—In a photographic printing frame, substantially such as described, the back made in parts, the adjacent edges of the parts bevilled from the face outward, combined with hinges upon the sides of the two parts, the axis or pintle of the hinges being in line with the front face of the parts of the back and the division between the two parts, substantially as described.

Correspondence.

H. P. ROBINSON AND AMERICAN APPARATUS.

Sir,—I note you have reprinted "Letters on Landscape to an American Friend," in which the author, H. P. Robinson, speaks well of the "Wale" lens, as fulfilling the requirements of a chief instrument for landscape work, although the largest size of this make quoted in the catalogue is of ten inches equivalent focus. It is advertised for eight by ten inch plates, and the price forty dollars. The article distinctly states that a lens for general use should be of the rapid rectilinear type, and the focus for eight by ten plates not less than thirteen inches. Mr. Robinson's remarks upon landscape outfits are less likely to be questioned than the utterances of many other writers upon that subject, and as the opinions referred to appear to be confirmed in that gentleman's second letter, the error has doubtless escaped his observation.

In writing upon this matter I have no idea of advertising the existence of the "Wale" lens in this country, for I never heard of it before reading Mr. Robinson's communication to the *Photographic Times*. Perhaps, therefore, he will favour us with an explanation of the advantages possessed by these instruments over older lenses of rectilinear type, such as those of Dallmeyer and Ross, which are used all over the world. Many of us are familiar with Mr. Robinson's chief pictures of medalistic fame, and it would be interesting to learn whether any of these were produced by the aid of English constructed lenses.

There are other points in the letter (No. 1) which might be commented upon—such as the recommendation to employ a wide-angle "Morrison" lens of eight inches focus, also a ten and a-quarter inch "Morrison," as well as a single meniscus—but I will leave these for the present, as I presume the majority of workers would prefer to use instruments of longer focus.—I am, sir, yours faithfully,

July 25th. W. M. Ashman.

THE EURYSCOPE LENS.

Dear Sir,—We should be much obliged if you would kindly insert the enclosed letter, received from Messrs. Voightlander and Son, respecting the use of their title, Euryscope, by Messrs. Perken, Son, and Rayment. Permit us to add, we undertake all responsibility for the publication of this letter.—Yours truly, Marion and Co.

Braunschweig, 18th July, 1887.

Messrs. Marion and Co., London.

Dear Sirs,—We duly received your favour of 16th July. The advertisement of Perken, Son, and Rayment you sent us has greatly astonished us. We assure you, and state herewith, that we are the first opticians who invented an objective named "Euryscope," the construction of which we published already in 1877, as every handbook of photography will confirm. The name "Euryscope," too, is at first employed by us. Until this day nobody has dared usurp this name, which we consider to be ours. How such a proceeding is to be judged, every honest man knows, and is unnecessary to say. That, furthermore, Messrs. Perken, Son, and Rayment put the words, "None genuine unless bearing trade mark," in their advertisement of their imitated construction, is only intended to deceive the public and mask the design. In the interest of all the photographers and amateurs, we hope that they will not succeed in their manœuvres. We shall be pleased to hear soon again from you in this matter, and remain, dear sirs, yours very faithfully,

Voightlander & Sohn.

[It is fair to state, in connection with this matter, that over a week ago Perken, Son, and Rayment distinctly told us that "euryscopic" would be substituted for "euryscope" in future, and that the punctuation of the advertisement referred to by Voightlander was not intended to convey the idea that no *Euryscope* is genuine without their trade-mark, but no *Optimus* lens is genuine, &c., &c.—Ed. P.N.]

Proceedings of Societies.

Photographic Society of Great Britain.

The following proposed new laws of this Society were discussed on the 19th inst.

I.—*The Society.*

1. The subject of the Photographic Society of Great Britain shall be the advancement of photography, and the branches of science and art connected therewith. Accepted without alteration.

II.—*The Council.*

2. The government of the Society shall be in in the hands of a council, which shall consist of a president, four vice-presidents, a treasurer, two honorary secretaries, and eighteen other members of council. Agreed to.

3. At all meetings of the Council five shall be a quorum.

S. G. B. Wollaston pointed out that five, including *ex-officio* members of council, would be a very small proportion to deal with the interests of the Society. He concluded by moving that nine be substituted for five.

W. M. Ashman seconded the proposition.

The **Chairman** said he should like to hear some better-defined reasons why five was not a better number to form a quorum than nine. They had five from the earliest times, and that proportion answered very well: it enabled them to get through their work. He would rather reduce the proportion of Council than increase the quorum.

T. Samuels remarked that the meeting had not the benefit of the names of those who had worked on the compilation of the proposed new rules, or an expression of their opinions upon the alterations. They had heard the proposition of Mr. Wollaston that the quorum of five be increased to nine, and if the Committee could show that to be an extravagant proportion of twenty-six it would no doubt be withdrawn, or more fully supported. He would ask that the reason be put before the meeting why five had been chosen, and whether five had practically been found to be better than any other proportion.

W. Bedford considered five a very good number to work; it enabled the Council to commence business earlier, as some always arrived late, which often delayed the reading of minutes and minor matters.

T. Bolas suggested an examination of the attendance book at council meetings. These were said to average from ten to eighteen at each meeting. Proceeding, he said that if a larger number was chosen to form a quorum it would tend to avoid reversals of former decisions. If a compromise could not be made, they might raise the number of the council.

The **President** thought that would be a point of weakness. He had had fifty years' experience of scientific society work, and always found five sufficient for a quorum.

T. Sebastian Davis had been many years in the Council, and agreed with the Chairman that five was quite enough for every purpose.

By consent, Mr. Wollaston's motion was modified to seven instead of nine, and passed.

T. Samuels said the provision of two honorary secretaries, instead of one, was so important in forming a council of the Society's members, that the meeting ought to know the reason why the duties had been divided. No doubt there were good reasons for a division of the duties, but he wished to hear opinions in support of the alteration.

The **Chairman** replied that most of the scientific societies have two secretaries, one to read papers, &c., and the other to attend to other secretarial duties.

T. Bolas remarked that excellent reasons could be given in favour of having two secretaries; additional work in a prosperous society was always being thrown upon the office of secretary, and this must be provided for.

T. Samuels cordially agreed with the change, but wanted it stated why the alteration was proposed. It was then agreed to.

4. The Council shall hold their meetings at such times as they may appoint. Agreed to.

5. The Council shall have power to make such regulations for the management of the Society as they shall see fit (not being inconsistent with the Laws). Agreed to.

III.—*The President.*

6. The President shall preside at all meetings of the Society and Council, and shall regulate the order of the proceedings.

E. Clifton pointed out a discrepancy between this rule and its effect upon Rule 20. He moved that the words "other than technical" be inserted after the word "meetings."

Frieze Greene seconded, and the motion was agreed to.

7. Should the President be unable to attend, one of the Vice-Presidents shall take the chair; and should neither the President nor a Vice-President be present, then one of the other members of the Council shall be appointed Chairman for the occasion.

8. The President shall deliver an address to the Society at the opening meeting of the Session in November.

The Chairman thought the proper time for delivering an address was at the annual general meeting; he did not know why November had been chosen.

E. Clifton proposed "November" be struck out, and the President select his own date.

R. Beeson seconded. Passed.

IV.—*The Treasurer.*

9. The Treasurer shall receive all moneys due to the Society, and shall pay such sums as may be ordered by the Council. He shall keep an account of all such receipts and payments, and render such statements to the Council as they may require. Agreed to.

V.—*The Honorary Secretaries.*

10. The Council shall appoint two honorary secretaries. The honorary secretaries shall attend the meetings of the Society and council, and take minutes of the proceedings. They shall conduct the correspondence of the Society, and one of them edit the *Journal*. If requested by the authors, they shall read the papers presented to the Society.

W. E. Debenham said that for such an important dutyas that of editing the Journal, it was a pity to limit the Council to selecting one of two for the post. He moved that the words "and one of them edit the Journal" be omitted. The Council would then be at liberty to select anyone else, even outside the Council, who might be qualified.

A. Spiller seconded.

W. Bedford admitted that the choice was practically limited to one of two, but it must be remembered that these special qualifications would guide the Council in selecting gentlemen to fill the posts.

T. Bolas thought it was merely a question of name; the council distinctly naming both hon. secs., so that if one was found insufficient, the other would be elected.

T. S. Davis and W. S. Bird followed in a similar strain.

G. S. Addenbrooke considered the editor's name ought to be officially stated in large type on the front page of the Journal, so that everyone could see who was really responsible. He concluded with moving an amendment, "That the editor's name be printed in a conspicuous place in the Journal."

Both motions were lost.

A. Cowan moved that the word "all" be inserted after "attend," in order to include technical meetings.

The Chairman: That is a part of their duty.

S. G. B. Wollaston seconded, and in doing so, desired to include in the duties that "proper notes of the technical meetings be taken." The necessity for so doing, he said, was felt by a large section of the members who indulged in the opinion that the technical meetings were quite as interesting, if not more so, than the ordinary meetings. It should be the duty of some secretary to see to this matter, even if it became necessary to elect a third or a fourth secretary.

The Chairman: Do I understand that the minutes are inaccurate?

S. G. B. Wollaston: They are incomplete.

G. L. Addenbrooke agreed with Mr. Wollaston, and thought an arrangement should be made to have a shorthand writer present to take notes.

The Chairman saw no sufficient reason for lengthened reports of technical meetings. They were established for the purpose of chatting over photographic matters informally, and close notes were not wanted.

G. L. Addenbrooke said it was very difficult for anyone not being a shorthand writer, to get down formulæ as uttered, and sometimes extremely important formulæ was given. It was generally considered that the subject was a detail for consideration in council. The matter then dropped.

A. Cowan's motion was carried.

11. There may be a paid Secretary, who shall be appointed by the Council, and shall discharge such duties as the Council may require. Agreed to.

VI.—*The Auditors.*

12. Two auditors of the accounts shall be elected at the ordinary meeting of the Society in January. They shall audit the accounts to be produced at the Annual General Meeting of the Society to be held in February. They shall have the power of calling for all necessary accounts and vouchers. No member of the Council shall be eligible as an auditor.

T. Samuels desired to mention that later on it would be noticed that no provision was made for the manner of appointing scrutineers, whose duties were quite as important as the auditors. He should bring this up again, but the question was, "How were the appointments to be made?"

The Chairman said the officers were selected at the January meeting.

W. S. Bird was sure that plan had hitherto been successful.

S. G. B. Wollaston thought that was hardly the point; it should be defined in the new laws, as it was in the one still in force.

The rule, having been again read, was agreed to.

VII.—*The Annual General Meeting.*

13. The annual general meeting of the Society shall be held on the second Tuesday in February in each year at 8 o'clock p.m.

14. At this meeting the council shall submit a report of the Society's proceedings, and a copy of such report, with the audited accounts of the treasurer, shall be sent to every member of the Society, with the notice convening the meeting.

15. Notice of the holding of the annual general meeting shall be sent to every member of the Society, by posting it to his registered address, at least seven days, and not more than fourteen days, previous to the holding thereof.

VIII.—*General Meeting.*

16. The council may convene a general meeting for any special purpose whenever they deem necessary.

17. The council shall convene a general meeting, for a special purpose, upon a requisition to that effect signed by not less than twelve members of the Society, and stating the purpose for which it is convened.

18. Notice of every general meeting for such special purpose shall be sent to every member of the Society, by posting it to his registered address, at least seven days, and not more than fourteen days, previous to the holding thereof.

W. M. Ashman moved that "annual" be omitted from title, and "s" added to meeting; that 16, 17, 18 appear under same title; that "special" be inserted before "general" (16), and "special" omitted before "purpose" (16); that "special" be inserted before "general" in 17, 18, and "for a special purpose" (17), and "for such special purpose" (18), be omitted.

S. G. B. Wollaston seconded.

After some discussion, the motion as regards 13, 14, 15 was withdrawn, and the remainder agreed to.

IX.—*Ordinary Meetings of the Society.*

19. The ordinary meetings of the Society shall be held on the second Tuesdays in the months of November, December, January, March, April, May, and June (or on such other dates as the council may appoint), for the election of members, reading communications, and other business connected with the objects of the Society.

20. The technical meetings of the Society shall be held on the fourth Tuesday of every month for the informal discussion of subjects of photographic interest, under the presidency of a chairman elected at each meeting.

21. Communications intended to be read to the Society should be submitted to the council for approval. Such approval shall not be considered as an endorsement of any opinions put forward in the paper. The date of reception of original papers by the council shall be considered the date of publication.

W. E. Debenham moved that the word "informal" (20) be omitted. Agreed to by general consent.

W. E. Debenham enquired whether the receipt of an original paper by the secretary would be considered the date of publication.

T. Bolas thought papers should be dated upon receipt by an officer of the Society.

The Chairman, when he was secretary of a Society, used to whip round for papers, and generally had a few in stock, but these were not dated. He hoped the members would be more diligent, and not let another meeting pass by without a paper for discussion. His opinion was that the receipt of a paper by the Society was the date of publication.

X.—*Election of Officers.*

22. The mode of election of officers shall be by ballot of the entire members of the Society. The president, vice-presidents, treasurer, and all the members of Council shall retire annually, but be eligible for re-election. Every member of the Society shall be at liberty to nominate one member as president, two members as vice-presidents, one member as treasurer, and six members as ordinary members of council; and, at least fourteen days before the last day for receiving nominations, a circular letter calling attention to this right of nominating shall be sent to each member at his registered address. The secretary shall inform by letter each nominee of the fact of his nomination, and "no reply" to the letter will be considered as acceptance of the nomination.

W. M. Ashman submitted that in his opinion it was undesirable that the whole of the officers should be eligible for re-election annually. He moved to add the following words after re-election; "unless they have served three consecutive years, in which case they will be ineligible to serve in any office for one year." The members, he thought, were entitled to elect one of the secretaries, and the Council the other, and he saw no reason why members should not have the privilege of nominating as many candidates as there were offices to fill.

E. Clifton seconded.

W. S. Bird said the secretaries were selected from the Council, and therefore elected by the whole Society.

T. S. Davis had served on council, and as vice-president for twenty-five years, but that long service did not deter him from working energetically for the Society.

The Chairman would not like to lose a good man from council.

W. Bedford thought the system would lead to getting an entirely new council unused to the work.

T. Bolas thought it would be better if all retired after three years' service.

T. Samuels did not wish the continuity of office to be broken as had been suggested. If eighteen members of council be elected, some could retire the first year, some the second, and on the expiry of the third year the others must go out. He had no fear of a good man being lost in that way; they would come back again if elected; in fact, former service should be a qualification for nomination. Any member of council who had not attended half the meetings should be ineligible at the next nomination.

The Chairman: But some gentlemen have to come fifty to a hundred miles; surely they serve the Society properly if they only come that distance when specially asked.

W. S. Bird was of opinion that to disqualify such men would not conduce to the well-being of the Society.

S. G. B. Wollaston moved an amendment, that a notice containing a list of the monthly attendances of council meetings be sent out before each election.

F. Baum proposed, as a further amendment, that the six whose attendances were lowest on the list be disqualified from serving.

These amendments were then put to the vote. For Mr. Baum's there was an equal number for and against. For Mr. Wollaston's, there was a majority. The original motion fell through in consequence.

W. M. Ashman moved that "six" be substituted by "twenty."

W. Bedford seconded, explaining that he did so to prevent collusion.

W. E. Debenham believed the reason for limiting the nominations to six was because only six vacancies occurred under the old rules.

G. L. Addenbrooke had an amendment to make, but would rather defer it.

J. Traill Taylor said it was extremely important that the adjournment, if decided upon, should take place on one of the usual Tuesdays, so as not to interfere with other societies.

The Chairman declared the meeting adjourned until Tuesday, October 11th.

Photographic Society of Great Britain.

A meeting of this Society was held in the Gallery, 5a, Pall Mall East, on Tuesday, 26th inst., W. England, Vice-President, in the chair.

An inability to sharply focus an image—although apparently well defined—during the hottest portions of the day having been mentioned as a recent experience, it was suggested by W. M. Ayres that the difficulty could be obviated by the use of tinted spectacles.

The Chairman and T. Samuels also spoke of the assistance given to the eye by reducing the intensity of a strong light.

The Hon. Sec., in speaking of the manipulation of stripping films, said it was necessary to adhere closely to the printed instructions, or failure would probably ensue. Two points were especially important: one was soaking, and the other pressure. In either case, if left too long, imperfections might be expected.

A. Jackson thought no harm would arise by leaving a film three or four hours in water, but if it remained twenty-four hours the gelatine would have become swelled too much. No evil consequences were likely to arise if the films were squeezeed on ebonite sheets and dried. They could be removed for further soaking at any time when it happened to be convenient to continue the process. In reply to a question, he said no preparation, beyond cleaning the surface of the ebonite, was requisite. To prevent the possibility of films sticking, it was advisable to add glycerine and methylated alcohol to the water.

W. E. Debenham enquired whether an illustration in the Society's Journal was issued as a permanent photograph, with the sanction and authority of the Society through its Council.

It was explained by the Assistant Secretary that the Journal had been issued in a hurry, and that the point referred to by Mr. Debenham had escaped observation.

An instantaneous shutter, and a metallic cage for supporting 5 by 4 negatives during washing, were shown. These were of commercial origin.

Stereoscopic effects then became the subject of discussion, in which it was pointed out that the dimensions of a stereoscopic slide might be greater in height without affecting the result. The statuesque portrait of Mary Anderson in the American Exhibition was also referred to.

The Hon. Secretary remarked that Mary Anderson's portrait conveyed the idea of solidity from a complete eradication of the impression of a flat surface in the mind of the spectator.

This led to some remarks upon the use of a tunnel in studio portraiture, in which the Chairman, W. E. Debenham, W. F. Donkin, and others, took part. The experiences related tended to show that the illuminated atmosphere intervening between the lens and the subject photographed was in many cases detrimental to brilliancy.

A series of Jubilee Procession photographs were shown by T. E. Freshwater.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 21st inst., H. M. Hastings in the chair.

The Hon. Sec. exhibited three photographs, about 20 by 15 inches, of groups of members and friends who attended the recent Convention. The negatives were taken at Tarbut, by John Stuart, of Glasgow.

J. B. B. Wellington showed several successful prints from negatives made with a detective camera.

L. Medland followed with caricature photographs possessing political significance.

Coating paper with gelatine then became the subject of conversation.

A. L. Henderson mentioned the plan of unwinding a roll of paper in contact with a solution of gelatine, as in the manufacture of carbon tissue.

A. Cowan thought for experimental purposes, pouring gelatine on a talced glass plate, levelling, setting, and squeegeeing paper thereon, and stripping when dry, was preferable.

Rapid shutters then became the topic, and most of the commercial shutters, together with their respective merits, were dwelt upon.

An extract from the *Photographic Times* was read anent ammonia-iron-alum as a clearing agent and intensifier. Opinions were expressed that its properties were of a reducing character rather than of intensification.

A short discussion followed upon the uses of iron and hypo as a blackening agent.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the usual bi-monthly meeting on the 19th, at Myddelton Hall, J. TRAILL TAYLOR in the chair, the President showed some large silver and platinum prints of groups from negatives taken at the Photographic Convention of the United Kingdom, by John Stuart and Richard Keene, at Tarbert and Craig Millar Castle.

F. W. Cox inquired the best method of obtaining a reduced print from a large one.

The PRESIDENT replied that he should make a reduced transparency on glass from the original negative, and then by contact printing obtain the reduced negative.

The President being compelled to leave in consequence of having to attend another meeting, Mr. Cox was voted to the chair.

William Swan was elected a member of the Society.

The HON. SECRETARY gave a brief report of the proceedings of the Convention.

A. P. HIGGINS having exhibited two mahogany half-plate double backs which had been purchased the one for 6s. and the other for 7s. 6d., the latter having a hinged shutter,

The HON. SECRETARY warned members from purchasing cheap photographic materials without exercising the greatest care in examining them before parting with their money. In the case of the two shutters passed round by Mr. Higgins, they must be far from light-tight, and he demonstrated this fact by pushing two thicknesses of note-paper into the slides while closed.

The CHAIRMAN remarked that it would be impossible to exclude light from such shutters unless the greatest care was taken with them. In his opinion, the American form, where the shutter was entirely removed from the slide in making the exposure, was the best.

The HON. SECRETARY, referring to the proceedings of the previous meeting, said that he had been trying one of the "right-about-turn" form of shutters, but could not succeed in obtaining a sufficiently quick exposure with it, and was now using a plain drop-shutter accelerated by elastic bands. He had had an opportunity of examining C. Wollaston's diaphragmatic shutter, and considered it both practically and theoretically perfect.

The CHAIRMAN did not think there was any necessity for very elaborate shutters. Exposures up to one-fiftieth of a second could be made with the plain drop shutter, and, in his opinion, there was nothing better, and there was no mechanism to get out of order.

A discussion ensued upon the best method of packing plates for travelling.

The CHAIRMAN said he always repacked his plates after being exposed in the same manner as they were originally packed by the maker, and had never had the misfortune to break any.

Mr. READER recommended packing the plates with pieces of white blotting-paper between them.

The HON. SECRETARY said he always packed his plates after exposure in a solid block face to face, and had never broken or damaged any; but in carrying plates as packed by the makers before exposure, he had often had the misfortune to find as many as two or three plates broken in one box.

Mr. READER inquired whether any member could give his experience of developing plates away from home.

The CHAIRMAN and J. HUMPHRIES both thought it a mistake to develop away from home, unless it was simply a trial plate.

The members will join in an excursion to Dorking with the Photographic Club on Monday, August 1. Train from London Bridge at fifty minutes past ten a.m.

PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

THE Committee met on 21st inst., when R. H. Callaghan, A. E. Ewen, F. T. Lupson, H. C. Roberts, J. B. Stokes, J. P. Turnbull, and Miss Godfrey were elected members.

Mr. BRIGINSHAW reported the action taken by him at the Convention *re* the Society, the result being of a satisfactory character.

Talk in the Studio.

THE DAVANNE PRIZE.—All processes in competition (see Note on p. 472) should be fully described in the descriptions forwarded to M. Davanne, at the office of the French Photographic Society, 20, Rue Louis le Grand, Paris. Negatives and prints should accompany the descriptions, and the last day for receiving processes in competition is December 31st, 1888.

WATTS' BIJOU ACTINOMETER.—The inventor of this instrument calls our attention to the fact that the number of seconds which are required to register a tint should be divided by ten—not by four, as mis-written by us last week.

THE FIRE AT THE STORE OF ANTHONY AND CO.—This fire, which took place on the 12th instant, is referred to in another part of the NEWS, and in a card dated July 16th, the firm says:—"We have resumed business and are filling orders, and we merely say to our friends that there is no way that they can do us more good than by sending along their orders as fast as possible, and we can fill all demands with reasonable dispatch, having laid in a new stock from our factories and elsewhere of such goods as were burned."

PHOTOGRAPHIC CLUB.—The subject for discussion on August 3rd will be "Colour Photography." Bank Holiday outing at Dorking; train from Victoria 10.30.

To Correspondents.

⁂ We cannot undertake to return rejected communications

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

SULPHO-PYRO.—Roughly speaking, one ounce and a third is the equivalent quantity; at any rate, you may take this estimate as near enough for all practical purposes.

J. P. M.—An employer who fails to return specimens intrusted to him by an applicant for work, is at the very least guilty of heartless thoughtlessness, in itself so bad as to be almost criminal; but cases have occurred in which photographers have not only stolen the specimens intrusted to them in order to exhibit these specimens as their own work, but have deliberately advertised with a view of obtaining such specimens from those seeking situations, and we need not enlarge on the villany of such a course. If you suspect that this latter has happened in your own case, let us have full particulars, and we will communicate with the Police authorities, and otherwise advise you. 2. It is decidedly advisable to include a stamped directed envelope for their return.

PHOTO.—Varnish it with clear copal varnish of good quality.

URANIUM.—It is claimed—and apparently with reason—that the developer in question requires a shorter exposure than most other developers, so it may be you have rather over-exposed. If this should not be the case, we would suggest a slight increase in the proportion of carbonate of potash.

W. W. R.—It is an organic acid having a class relationship with phenol or carbolic acid, and it is a very useful antiseptic for preserving gelatinous substances. You can obtain it from Hopkin and Williams, Manufacturing Chemists, of Cross Street, Hatton Garden, London.

D. S. JONES.—In your first no name was given, so the stamps could not be returned. They have now been sent.

CHAPMAN JONES.—1. The fresh packet of MS. to hand; thanks. 2. We will try; remind us occasionally by post card.

SLOW PLATE.—Very well suited for such work; indeed, better suited than most rapid plates that we have had to do with.

J. WATTS.—The essential point of your letter has been noted in another place; and we generally agree with all that you say.

McLENNAN AND CO.—It appears to us likely that the mount contains some deleterious substance, and that this is brought out specially where a large quantity of mountant has been used. Test this view by wetting a card in certain places, and then mounting a picture on it.

X. Y. Z.—None, unless you yourself act unreasonably. Show your camera and explain the matter.

COL. MITCHELL.—We have replied by post.

C. MOORE.—You had better write to Alfred Bool, 115, Harwood Road, Walham Green, London.

BYRNE and CO.—A number of photographs have been received from you, but no communication having reference to them.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1509.—August 5, 1887.

PATENT OFFICE LIBRARY

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PHOTO-SCULPTURE.

At the present moment there seems to be a tendency to revive that so-called photo sculpture which was one of the topics of conversation nearly a quarter of a century since.

It is not the custom for the sculptor of the present day to commence work directly upon the marble, the first step being to build up a model (on a somewhat enlarged scale) in plastic clay. From this model, which, in drying, contracts to the required size, the marble is roughed out by a system of measuring and mechanical cutting, after which the work is done by hand-tools—first used by a subordinate artist known as a statuary, and finally by the sculptor who constructed the clay model. In the so-called photo sculpture, neither marble nor clay is directly modelled by a photographic agency, but the photographic outline is used as a guide in fashioning a correct outline to the clay of which the original model is made.

The photographic guides for photo-sculpture, as introduced by Willéme, in 1864, and as practised during the following year at Claudet's studio in Regent Street, were ordinarily twenty-four in number, and all the exposures were made simultaneously upon a sitter who was seated with a circular battery of twenty-four cameras directed upon him.

Each of the resulting photographs corresponds in its outline to the vertical section of the required bust in one position, and by trimming the photographs so as to obtain cardboard silhouettes, and using each in succession as a guide in cutting out the clay—the block being turned one twenty-fourth of a circle after each operation—it is easy to see how a roughed out clay model of the sitter could readily be obtained. Ordinarily, however, the original photographs were far too small to be of direct service unless the tool cutting the clay was attached to an enlarging arm of a pentagraph or a pentagraphic machine, but sometimes the photographs were enlarged, and the pentagraph was used also.

An article in the *Times* published during January, 1865, and referring to the cutting out of the clay by the pentagraph arrangement, says :—

"Four vertical sections—say figures 6, 12, 18, and 24—representing the four angles, which the cutter makes as rapidly as the pencil follows the outline of the drawing, are quite sufficient to give a rough sketch of the figure on the clay that is at once recognizable by any friend of the sitter. When all the twenty-four outlines have been transferred to the clay, and the more delicate details on the flat have been indicated, the mechanical part of the process is complete, and the artist takes up and perfects the work. Of course, upon his skill the final finish and delicacy of the statuette depends. It is not pretended that the mechanical process we have described can make a perfect statuette instinct with life and feeling. All it assumes to do is to give the modeller perfectly faithful outlines of nature ; his mind or fancy must finally build upon this foundation, and put Promethean fire into the work. Copies are taken, of course, in the ordinary manner, the new process only taking the place of the modeller's hand in giving form to the clay. We do not suppose that statuettes produced in this manner will ever become as popular as the carte-de-visite, as their cost will put them beyond the reach of the masses. Small busts are, however, sold in Paris as low as a guinea each, and, doubtless, the prices will fall with increased facility of production, which is certain to follow upon an increased demand for them."

Photo-sculpture, although many had great hope from it, was not a commercial success. The time was probably not ripe for it ; and the difficulty of serving twenty-four cameras with wet plates in hot weather was alone almost enough to damp the ardour of any photographer who might think of photo-sculpture. Now the case is different, as with twenty-four cameras charged with reliable dry-plates, and all cameras brought into simultaneous action by an electric or pneumatic uncovering of the lens, one may be reasonably sure of securing all the outlines with certainty, and of obtaining such photographic detail as shall guide the modeller in finishing the clay as cut by help of the photographic outlines. Renewed attention will probably be given to photo-sculpture, and it has recently been the subject of discussion at the meetings of the Photographic Society of France.

We would suggest that with modern rapid plates it may be better to place the sitter and his chair on a divided turn-table, and to make the exposures with one camera, than to use twenty-four separate instruments ; or the turn-table may be used with, say, four cameras, in which case six shifts of the turn-table would be required to produce the twenty-four photographs.

We can, however, leave such photographic pointss to our readers, who are quite competent to work out the details of manipulation ; but in order to give them some notion as to how the sculptor manipulates his clay, we have induced Albert Toft, the now eminent sculptor, who so successfully modelled the President of the Photographic Society, to write us an article on "Building up a Bust" (see page 482), and this will prove of great service to such readers as may wish to exercise themselves in photo-sculpture. It may also be useful to quote a provisional specification lodged by David Gay in 1865. Mr. Gay says :—

> This invention relates to an improved method of treating photographic portraits when intended to be employed for obtaining sculptured models therefrom, and consists, first, in

cutting the material on which the portrait is taken or printed, as may be found most desirable, and in using the marginal or outer portions of the materials as templates, which I propose to arrange and operate with in the following manner:—For example, upon a circular table or bed plate I arrange or dispose, say, a dozen blocks capable of sliding in radical grooves, by means of screws or otherwise, towards and from the centre of the circular table aforesaid, and in each of said blocks I fix an upright rod with clips affixed thereto for holding the before-mentioned templates; I also mount the aforesaid circular table on an upright pivot, the principal length whereof is formed square, and the extremities round. The upper end of said pivot carries a loose collar with slots about its periphery to receive and hold steady the several templates aforesaid. The material to be sculptured is placed in a plastic state on the aforesaid upright pivot, and said plastic material roughly shaped by hand previous to operating thereon by the several templates, as follows:—Having obtained, by any suitable means, the requisite number of photographic pictures from different points of view of the person or object to be sculptured, I then proceed to cut out the picture; for example, suppose it be a profile, I carefully cut along the outline of the forehead, nose, mouth, and chin, and use the outer divided portion of the material as a template, which I place in the clips of one of the upright rods aforesaid, and in this manner I proceed with each different photographed position of the person or object to be sculptured, and having fixed all the templates thus obtained in proper position, I commence to operate therewith, as follows:—I take first that template containing the most prominent outlines, and pushing it into contact with the plastic material aforesaid, hold this template steady with one hand, and with the other hand move the plastic material partly round backwards and forwards until the template has scraped the material at this part to the shape of the template, or partly so, and in like manner I proceed successively with all the other templates, until I bring their edges close together in the collar that supports them, after which the sculptured model may be finished by hand; and where several copies are required, I take a mould thereof by any of the well-known means, and pour plastic material therein in the manner commonly practised of moulding objects in plastic materials.

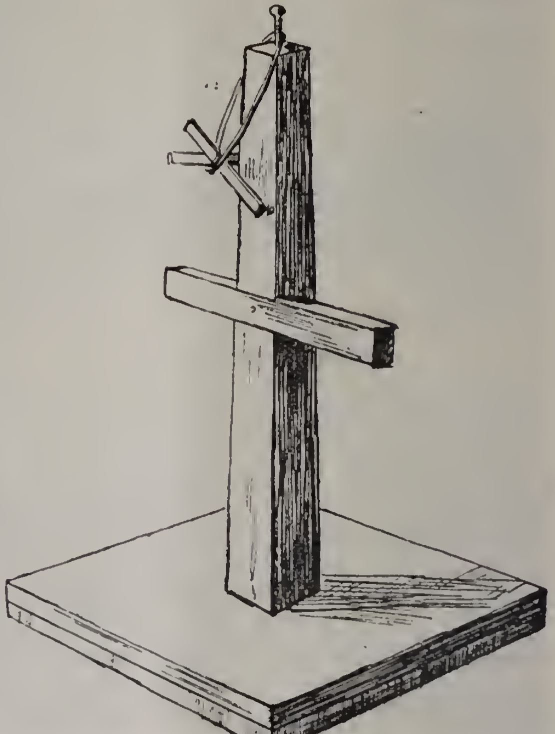
A recent article on "Photo-Sculpture," by M. Lazard, will be found on page 484, but the information it gives is not very detailed.

BUILDING UP A BUST.

BY ALBERT TOFT.

"First get your clay," to paraphrase the well-known saying of Mrs. Glasse, of culinary fame. This, however, whatever the locality in which the sculptor may pitch his tent, is a matter of little difficulty. Clay is common enough, and I have known a good bust made from the clay of an ordinary brickfield; and, strange to say, I have seen busts which gave one a bad opinion of human nature, suggesting a nightmare of the Chamber of Horrors, produced from the very best French clay. However, it stands to reason that with a good clay the task of the modeller is made more easy. To begin at the beginning, if you start with a "rude" and dry clay, put it into a tub over night, and in the morning, when the moisture has soaked well through, and the clay is in the condition of "slip," pass it through a coarse sieve to get rid of the rough particles. Then put it on a board to dry, until it is of the consistence of putty. With regard to the time when to use the clay, the happy mean is preferable, as in most things in life, and the young modeller can adopt the the poet's line with advantage: "Be not the first by whom the new [clay understood] is tried, nor yet the last to lay the old aside." New clay, in working, proves what is technically called "short"—that is to say, it is not elastic. On the other hand, clay when too old becomes what is termed "rotten"; it lacks cohesion, is friable, and given to crumble. Clay in the middle stage spreads well, is elastic, and, with less labour, produces better work, having no "spring," and so preserving the intended form.

So much for the raw material; now for the scaffolding of the bust. In a sculptor's studio this is a very simple affair. An upright "peg," some twenty inches long, tapering towards the top, and resembling nothing so much as a miniature Cleopatra's Needle with a flattened apex, is fixed into a wooden platform some eighteen inches square. This square, to prevent warping, is formed of two pieces of wood, the lower portion having the grain of the wood reversed. The reason for the peg will be seen later on. It is purely and simply a stay to hold up the bust. For the tyro it is, however, better to build up the bust on a support shaped like a Latin cross, the shoulder or limb fitting into a "slot" cut in the upright—a square "dowell;" in other words, with one side exposed. And yet another way, to again quote from the cookery book of worthy Mrs. Glasse—and this the method adopted by students in the Schools of Art at South Kensington and other Schools of Art in the provinces affiliated to South Kensington—an upright peg is made, as I have already directed; into this a nail is driven; from this nail, hanging from a piece of wire, is a cross-piece of wood shaped like a Greek cross, and called a "butterfly." This hangs loose, and in the modelling is pressed against the upright; but it always projects, and even with professional artists is found useful in cases where the head of the sitter leans forward. It must be noted that the limb of the cross is always to be put in the direction the shoulder will take, and is inside the extreme width of the bust. The "butterfly" is not only found of use when the head is very much over, but is specially advisable for students, to support or hold the head well up, if the bust be in hand for any long time.



Upright peg, showing "butterfly" and "crossbar."

So far, so good: we have our clay and our substructure. Now for the tools; they are always handy, in fact, they are our hands. With the fingers, broader, bolder work can be produced than with any tools, no matter how elaborate. Old Nollekins, outspoken as he was, said, "My best tool is my thumb." It was this anything but courtly old artist who told the Duke of York—when the "Soldier's

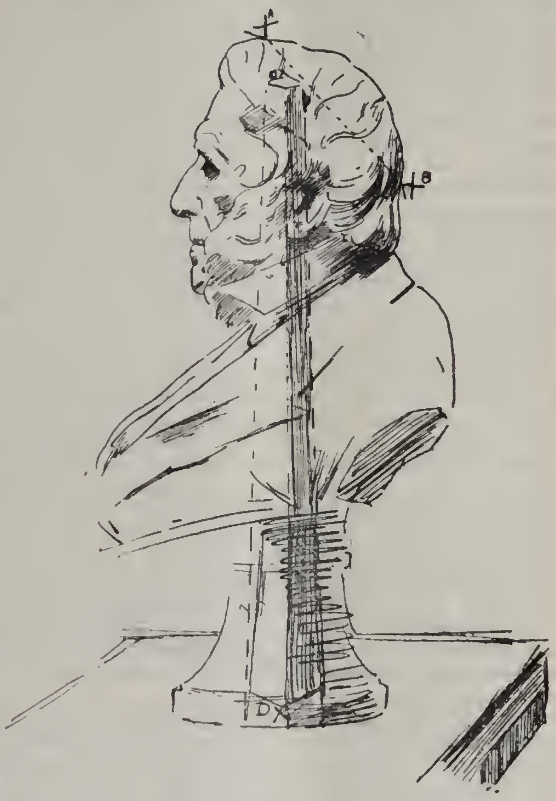
Friend" at a sitting chanced to say, "My brother, the Prince Regent, knows you very well, Mr. Nollekins"—"Knows me very well? Don't you believe him; it's only his brag." With your fingers you have more freedom in handling your clay; whereas, by working too much with even the best of tools, you are apt to get your work "niggling," as if a water-colour artist endeavoured to produce effects by "stippling," or "cross-hatching," instead of by bold washes. In point of fact, I do believe that if a clay model had ever been made of the world-known Frieze of the Parthenon, that no tools, save those nature gave, were used; the general effect is so broad and grand; and in proof of my assertion, I would undertake to copy the Frieze, using my fingers alone.

We will now get to work, having arranged all preliminaries. If we know our sitter and his or her characteristic pose, to save time before the sitting it is as well to construct a head roughly, a matter, say, of an hour's work. Take one or two measurements on beginning operations, adding one-twelfth to allow for shrinkage, if it is intended that the bust shall be life-size when fired. But avoid what I may term chronic measurement. Gustave Doré was said to have "collodion in his eye;" and the true aim of a bust—after having made certain of the bony construction, a point to be watched by looking well from underneath –is to secure the general character of the sitter. In a word, not merely to set down the features, but the man behind the mask. For this reason, no sitting should exceed from an hour to an hour and a half in length. Photographers will perfectly understand the value of securing the expression; and how can this be done if the sitter becomes tired, fagged out, or bored? Quick does it. Indeed, for a sketch bust, frequently as good a likeness is secured in the first or second sitting as if the client or "patient" were a member of Parliament sitting out all the amendments on a Coercion Bill. A sitter will not ask, I feel assured, to sit altogether for more than ten hours, nor should he or she be required to do so. Here photography, as I shall show soon, comes in as a true friend to both sitter and artist.

Keep your bust moist during the period you are working on it. Spray it over with a fine garden syringe, or, still, better, use what I may term the "mouth syringe." Fill your mouth full of water and squirt between your teeth. This, however, requires practice. It is done as the "artist" at a Paris half-franc restaurant gives the "eyes" to his soup. The beef of which it is made is innocent of fat, so he supplies the want of nature, and, filling his mouth with oil, sprays gently as dew over a number of basins. This fine spray is excellent in water as well as oil, but until the knack is acquired, trust to the garden syringe. At night, or when not working on, cover up with damp cloths all round.

Our bust is finished. The next step is an easy one: to let it "set," let some of the moisture dry out. Then comes a crucial operation, the "hollowing," and taking it off the stick or upright "peg." Buffalo Bill or Red Shirt could give one or two wrinkles in this matter, only they do not go far enough: they stop short at the "scalping." The sculptor trepans and takes off part of the crown. This is done with a very thin wire or thread, so that when the hollowing is finished, the piece taken off may "mitre" well, and preserve the modelling. Every country boy knows how to make a "ghost"; some sculptors are said to employ one. Imagine, then, that the bust is a Swedish turnip, and scoop away, leaving a uniform thickness of one and a-half inches. If this be not left, the bust will be apt to bulge or "sag," as in *cire perdue* the molten bronze will attack the weaker portions, a fact some well-known sculptors have learned this year to their cost. Clear well away round the stick, and whether the "butterfly" be attached or not, the bust will come off, if properly set, like an old glove. There are three reasons for this "hollowing," or rather four: it lessens the weight, saves time in drying, eases the firing, and lessens the risk of splitting.

Our bust has now "five bars rest," until it passes away from the "green" or wet stage, and becomes hard and dry. So we will leave it alone whilst I say a few words on a point I have omitted. The colour the clay will take when fired is an important consideration. It must not be too red, or it looks garish; or too pale, then it will lack life. The question is, as in making a salad or producing a bowl of punch, in the mixing. Black, or, rather, a slaty coloured, clay may burn red, and, strange to say, brown or buff clay burns nearly the same colour. How to secure a chromatic scale ranging from buff to deep red is one of those things only learned by experience. I have been taught it in that school, and my readers must take lessons from the same eminent teacher. Every artist makes his own palette.



Dotted line from A to B is where we cut off the back of head to hollow out. C to D shows the upright peg through the head and shoulders, without "crossbar" or "butterfly."

The bust is dry; now for the "firing." The "kiln" should be as for roof tiles, which are porous. For terracotta the fire must be mild, or, as it is termed in the potteries, "soft." Not only does the colour vary according to the heat, but the "hard" strong fire, such as is used for drain pipes and non-porous ware, may possibly not only "twist" or "warp" the work, but even split it into fragments, when the mischief is irreparable.

This is more or less a technical paper; still, as it is on Art, there can be no harm in contrasting two styles of work, the one all refinement and delicacy, the other all strength and grandeur. Take Donatello in all his original purity, with his low reliefs modelled, without his knowing it, on Assyrian prototypes. Take the low reliefs of Flaxman, or a work of to-day, the "David and the Lion" in the Guards Chapel, Wellington Barracks, by Mr. H. Hugh Armstead, R.A. Look at a bust of Donatello if you wish to model the face of a beautiful woman or that of a child, innocent as a cherub, fresh as a blossom, a tiny bud of humanity; if, on the contrary, we have to model a statesman, a man of thought or a man of work, we must take as our example the Titan of art, Michelangelo; a strength, force, and grandeur are the characteristics of him who hewed the "David" from the marble, conceived and executed the "Dawn" and "Evening," the "Night" and "Day" on the tombs of the Medici at Florence.

Now comes a question—Is photography of any value to the sculptor? Undeniably, of very great value, if—ever an "if"—if used with discretion. Some years ago a new idea was the fad of the day. It was called photo-sculpture. The sitter was taken from sixteen points of view. But the result was failure. Good photographs are of marvellous utility, more especially if the artist succeed in getting the sitter at his best. I would recommend five photographs to be taken, four as rapidly as possible. Two profiles—a left and a right—for every one has a good side to his face, or one better than the other, a front face and a three-quarters. The reason for taking these as nearly as may be at the same time, is to secure the same expression. And a back view of the head. This may be taken at any moment. The expression does not change, unless the sitter chance to be a bald man, the day a hot one, and the necessity occurs to leave off his wig.

But the photos must all be "proofs." They must never see the retoucher's table. The retoucher removes the lines that care and thought have cut in the face of every man. Each and all of us, for good or ill, is his own sculptor. Charles Dickens, speaking of a little child, said, "The baby is full of wrinkles; bye-and-bye Time will smooth them all out, only to cut them in more deeply and indelibly." A photograph retouched is worse than useless—it is false, untrue, misguiding. The sitter may not emulate Oliver Cromwell, and the artist may not, like Samuel Cooper, give all the warts, but if he flatter to the extent of excising every line, he will produce a head such as the world has never seen worn on any shoulders. Laughter as well as care brings wrinkles, and be the philosopher Democritus or Heraclitus, the result is the same: the extremes of life meet in wrinkles.

One last word: use the photograph with discretion. It is to serve as a reminder, an aid to memory, not a standard on which to work; and as an aid, one to spare the sitter, and enable the sculptor to work, in nautical parlance, "hand over hand," the photograph, the "proof" photograph is invaluable.

That is all; as Dr. Lynn, the wizard, puts it, "That's how it's done." The best medium with which a painter can mix his colours is brains, and the sculptor, amateur or otherwise, will find the "grey matter" of no little use, even in Building up a Bust.

TO THE ENGLISH LAKES WITHOUT A CAMERA.

BY AN "INDUSTRIOUS CHEMIST."

"To be, or not to be? that is the question." When, with camera and requisites provided, I asked myself whether I should take them with me on a recent tour to the lakes of Cumberland and Westmoreland, my answer would have been clearly in the affirmative had I been going there direct; but as it was my intention to visit the Manchester Exhibition, Prestwich, Warrington, and to go into Derbyshire on my way north, the course was not so clear, and I finally determined to leave them behind.

I do not repent this resolution, or want of resolution, for I was never out of sight of a camera from the moment of my leaving Euston Station on my outward journey. Cameras by train, coach, on board steamers, boats, everywhere I went, profoundly impressed me with the fact that dry plates and sensitive films have so vastly increased the noble army of amateur photographers this season, that I felt almost distinguished by going without one, and being this time only a passive observer of the picturesque. The joke in the *Philadelphia Photographer* is hardly overdrawn:—"Will you allow me to take a picture of the old mill yonder?" "Yes, if you can find room. There's twenty of your amachewer fortographer fellows down there now!" Well, this I may report to be the congested state of the English lake district just now. Cameras everywhere on land, snap shots from steamers *en route*, and paddlers on beach intent upon getting a bit of water as foreground to their pictures. Amphibious as well as aquatic!

The Windermere yacht race, twelve starters, on the 20th July, must have been well recorded, for the day was brilliant; indeed, the weather has been for many weeks propitious for all purposes except the waterfalls. Stock Ghyl and Skelwith are almost dried up, Elter Water has shrunk into two small tarns, and the Brathay River dwindled to a tiny stream; the stepping-stones on the Rothay also being high above water level. On the higher lands, what once was bog has become beautiful dry turf, and easy walking. The rainfall for July must surely beat the lowest record.

On the high roads the telegraph posts are beginning to be a hindrance to the photographer, about Ambleside and the Kirkstone Pass especially. The mining operations in connection with the Thirlmere Water Works are just now a little drawback to Grasmere. but promises to be only temporary. The steam gondola on Coniston Lake is really a picturesque object, and Windermere looks lovelier than ever. Road travelling is wonderfully cheap, and lodging accommodation abundant, because of the counter attraction of the Manchester Exhibition, which everyone now going North feels bound to visit, if only to see the picture galleries—thirteen fireproof rooms containing famous treasures of art numbering over 2,000.

The meeting of the Society of Chemical Industry, 13th, 14th, 15th July, took me to Manchester, and I never saw so much before in three days. It was altogether a successful affair, but I am bound to say that the promised illumination of the Derbyshire Caverns by magnesium light (for which I felt half disposed to take my camera) did not come off, but only resolved itself into burning a few squibs, containing magnesium perhaps as one of the ingredients, but which filled the caverns with fume and smoke, so that we were glad to get away.

I have only to add that the best views of lake scenery are those now shown by M. Bowness, Herbert Bell, Frith, Pettitt, and a new instantaneous series by A. Green; and that photography is well represented at the Manchester Exhibition, not only in the section specially devoted to it—where will be found an exceedingly interesting historical collection—but throughout the building. Good portraiture and astronomical subjects in the Irish department, and everywhere splendid representations of machinery.

PHOTO-SCULPTURE.

BY M. LAZARD.*

I take two photographs of the subject at a horizontal angle of 45°, and the subject is lighted by light coming from a small surface, and the rays must traverse a frame having stretched upon it some threads which are quite straight and uniform. This frame is placed quite square and vertical in front of the model, and it is necessary that the sensitive plates should also be vertical.

The negatives obtained are placed quite vertically in a projection apparatus, and are projected upon a screen placed vertically, but inclined at a horizontal angle of 45°.

By the aid of one of the points of a special pentagraph the outline of the projection is followed, while the other point cuts the outline on the plastic matter. When the profile is cut, the required movement is given to the support on which is placed the plastic material.

When one profile is completed, the next is cut in the same way, taking care to so adjust the projection apparatus as to obtain register with the profile already cut.

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* Abstracted from a communication to the Photographic Society of France.

It is possible to model the whole figure by the same method; but as the modelling of the draped figure does not require extreme exactness, it is sometimes easier to do the work by hand, simply guided by photographs, or by the presence of the subject.

ELEMENTARY PHOTO-MICROGRAPHY.

BY ANDREW PRINGLE.*

We must now devote a moment to the camera. It should be a good strong camera with a stretch as long as possible, for on the amount of stretch depends, *cæteris paribus*, the amount of amplification. No swings-back of any kind are required; they are, in fact, better absent. The commonest make of wooden camera will answer, provided it will stretch, and is strong and light-tight. For simple work and small amplification the ground-glass of the camera usually suffices for focussing, but where very fine work is to be done with high powers the ground glass is too coarse. I have used two surfaces for focussing in such cases, in each case placing the prepared plate in a wet plate slide, drawing the shutter, removing the back, and focussing on the plate with its prepared side to the front. The first way of preparing a plate for this purpose is to rule a few lines—not scratches—with a diamond, in squares on the face of the plate. This gives the very finest surface for very high powers and difficult subjects. A plate intermediate between this and ground glass is prepared by just fogging a sensitive gelatine plate, developing and fixing it, bleaching if necessary with mercuric chloride. This plan I found in a book the (author's name, I am sorry to say, I forget); it is a capital dodge. In all cases a focussing eyepiece will be required. I use the ordinary focussing ocular used in photography, but I am careful to have it itself carefully focussed by examination of a small speck on a window pane.

I think we are now in a position to suppose ourselves about to make a trial. It is well to arrange for a week's absence from the family circle, pay the household accounts, lay in a good supply of cooling drinks and a few pounds of tobacco, pay an affectionate farewell to the babies, and a ditto embrace to the missus; for the new-born photomicrographer is not much good to anybody till he has cut his first tooth. There is an irresistible and engrossing fascination in this work that cannot be escaped nor ever forgotten. When I began I did not for three weeks get beyond a distance of about fifty yards from my dark room. I was smitten as with a pestilence; a grim mania for new objects to conquer possessed me; I revelled in the very names of tubercles, Graafian vesicles, malignant tumours, sloughing phagedæwa, tapeworms, bugs, fleas, lice, and nauseating skin diseases. The horse parasite was of more importance to me than the horse in the stable. My flowers suggested to me only the names of red spiders and aphides. Paring my nails became a polariscopic operation. I would have skinned a mouse for a single hair, stormed a bee-hive to get a sting, and I even excoriated myself for a specimen of *tinea versicolor*.

This, however, is not business, though it is truth. Nothing but common-sense and experience can teach us to centre our object on the ground glass and to focus it. The apparatus I have described ought to explain itself. It is necessary to know in the first place what points of our object we require to bring out particularly. I made several photographs of various objects before I discovered what were the parts that I ought to emphasize. In many cases I had actually to ask what the important part was. If we try to photograph complete objects on anything like a larger scale of amplification, we shall find optical difficulties almost insurmountable at the very outset. Our lens will want "penetration" or "flatness of field," and practice alone will teach us what our lenses will do and what they will not. "Penetration" is the equivalent of what we call "depth of focus;" "flatness of field" corresponds to some extent with our "covering power." The best plan is to begin with some very flat object of considerable area and fairly light colour, and to find out to what extent we can enlarge it with a rather low-power lens. We must find out once for all, to save trouble, the amount of our various amplifications. Here is the way to do this. Put a stage micrometer on the stage. The lines are drawn at distances of one-hundredth and one-thousandth of an inch apart on the micrometer. Focus the micrometer lines at the distance we intend to work at, and with the lens we intend to use. Then measure the interval from one line to another on the ground-glass, and a simple calculation will tell us our amplification. If on the ground glass the one-hundredth lines are exactly one inch apart, evidently the amplification is × 100, if quarter of an inch the amplification is × 25, if three inches it is × 300. I made measurements with all my lenses at all my distances, and wrote a list of the results, so that now at a glance I know the extent of my multiplications.

I soon found that sometimes, though I got my objects fairly well represented in my prints, I got poor grey backgrounds. I therefore proceeded to find out by experiment the exposures necessary to give black negative backgrounds when no object was on the stage. These results, too, I tabulated, and they now form a list of minimum exposures for the various lenses and distances. I found, the whiter the light, the better the background, so I recommend the addition of camphor to the paraffin in the lamp. I hope soon to discard paraffin entirely in favour of the oxyhydrogen light.

So far as I have found out by perusal of books on photo-micrography, the writers, for the most part, have been very good microscopists, but rather shaky on photography, and, so far as I have seen, the producers of photo-micrographs of magnificent microscopic qualities have not been fully alive to the necessities of a photo-micrographic negative. What we want is not what we call in photography a good negative. We want for photo-micrographic work a negative that in pure photography would be called "flat." In short, we should sacrifice everything for sharp and full details. Density in parts is no doubt very pretty and very artistic, and very agreeable to our notions; but it is out of place in a photo-micrograph. A photo-micrograph is a purely scientific production; there is no fine art about it, however much people may quibble on the matter; and we must put aside all ideas of balance, symmetry, pictorial composition, and chiaroscuro. What we want is material, not ideal. I spoiled a good many negatives by trying to make pretty pictures and good negatives according to usual acceptation. I am very fond of "Pictorial Effect in Photography," both to read and to practise; but we must ignore Mr. Robinson—forget him we can't—in photo-micrography.

There are two classes of objects which we may have to photograph. Class I.: Dense, semi-opaque, highly coloured. These sometimes cannot be photographed really well at all, but the line to follow is to use a rapid plate, ample exposure, and perhaps a tinted light of, say, blue colour. These should be highly developed with a small percentage of pyro. Class II.: Colourless or very thin, but not transparent objects. (There are many objects so dear that they cannot be photographed by direct light at all. I hope to say more of these next year.) For translucent, or thin, lightly-coloured objects we require a white light, shortish exposure, and a slow plate giving contrast, which we may enhance by prolonged development.

ON PHOTO-MICROGRAPHY AND ITS VALUE IN BIOLOGICAL RESEARCH.

BY EDGAR M. CROOKSHANK, M.B. (LOND.), F.R.M.S.*
(Lecturer on Bacteriology, King's College, London.)

Before showing you my results, I will draw your attention to the apparatus which I have used in this investigation.

The essential apparatus for this work consists of a camera fixed upon a base-board four or five feet in length, upon which the microscope can be clamped, and which carries also a lamp and a bull's-eye condenser.

Simplicity and economy must always be borne in mind. Yet to fulfil all the purposes for which the apparatus may be required, including the employment of the highest powers, and also that one may be enabled to work for long intervals of time with due comfort, I found that an accurate and complete apparatus was most desirable. Again, most preparations, it is true, will admit of being photographed when the stage of the microscope is vertical; but if we require to photograph micro-organisms in liquids, or the colony-growths in gelatine which has been partially liquefied, the apparatus must admit of being placed so that the stage of the microscope becomes horizontal. In addition, the apparatus is rendered somewhat complex if we employ powerful artificial light. Sunlight, no doubt, is the best and cheapest, but it is not always available, especially in a city like London; and, moreover, evenings and dull days will probably be the very time which can be best spared for this work. We must, therefore, fall back upon the paraffin lamp, or the magnesium, oxyhydrogen, or electric light.

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* Continued from page 444.

* Continued from page 475.

To fulfil these conditions Messrs. Swift and Son have constructed the apparatus which I will now show you (see fig.).* It is merely a modification of the ordinary horizontal model, admitting of being readily placed in the vertical position, while the illumination is supplied from an oxyhydrogen lantern.

To place the apparatus in the vertical position, two small hinged brackets at the end, distant from the camera, are forced up with a smart blow of the hand. The corresponding ends of the stretcher bars are dislodged from their fittings, and allowed to descend; when horizontal, the opposite extremities of the bars are easily released from their sockets. The leg or support at this end can then be turned up and fixed underneath the apparatus by a button, and the end of the apparatus itself gently lowered to the ground. A hinged end-piece is also to be turned out to increase the base upon which the whole apparatus will stand when raised to the vertical. The two legged support at the opposite end of the apparatus is next worked down by a quick thread screw, and, on raising the apparatus to the vertical, the two-legged support drops to the ground, and assists in maintaining the stability of the whole. If it be thought necessary, a simple means can be readily devised for clamping the apparatus in either position to the wall of the room, so as to eliminate as much as possible all chances of vibration. A second quick thread screw moves the base-board upon which the camera and central sliding-board are mounted, so that the camera, microscope, and lantern can be raised to a convenient height above the ground.

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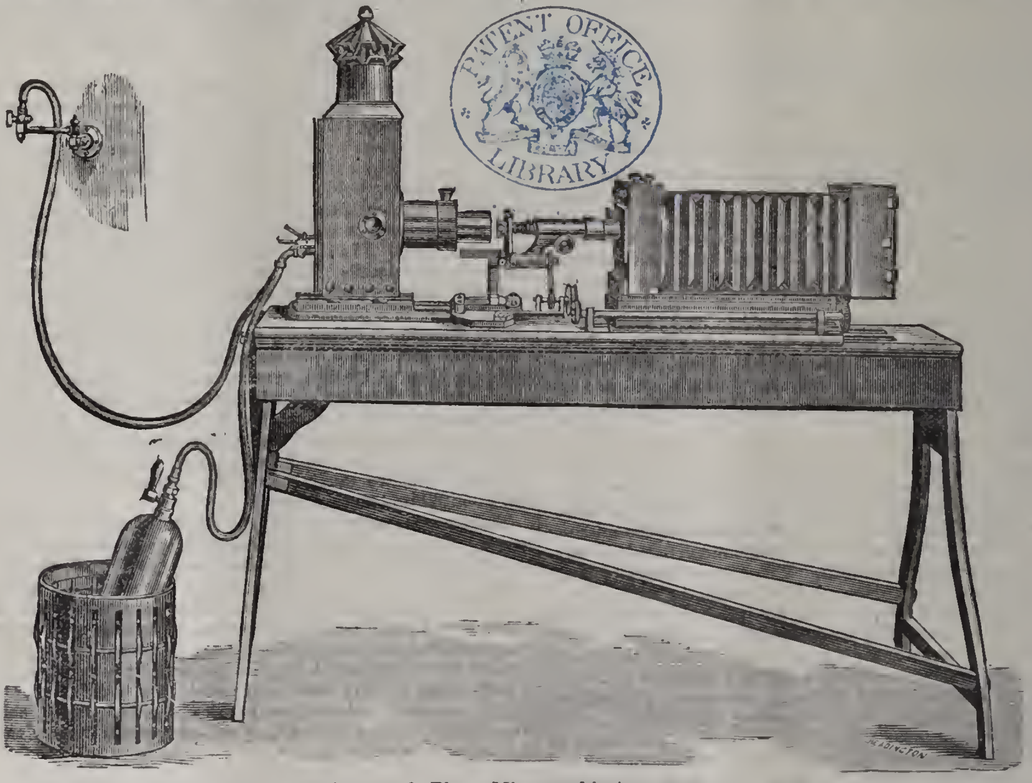

Reversible Photo-Micrographic Apparatus.

The various parts of this apparatus I will describe more in detail.

First of all I will take the microscope. The stand utilised was one which had been constructed by Zeiss, but any good stand may be adapted in the same way. The advantage of Zeiss' stand, for bacteriological photography, is that the wide stage forms a steady support for cultivations on small panes of glass coated with nutrient jelly. A mechanical stage greatly facilitates manipulation with the highest powers; but it is not indispensable, for I have taken, without the use of one, all the photographs before you, though employing, as a rule, a $\frac{1}{25}$ hom. imm.

It is most essential that the microscope should be perfectly steady. To ensure this the horse-shoe footpiece of the Zeiss' stand fits under a projecting ledge, and is then clamped by a cross-piece, so that it is firmly fixed.

The microscope, with the means for clamping it, and the oxyhydrogen lantern, are carried upon an independent sliding-board, which admits of movement to or from the camera. The sliding-board also moves upon a centre, which enables the microscope to be turned out from the median line—in fact, to be turned at a right angle to the position it occupies when ready for the exposure. The object of this contrivance is to enable the operator to sit down by the side of the apparatus, and with comfort to arrange the object in the field of the microscope. On turning the microscope back into the median line, it is fixed in the optical axis of the apparatus by means of a stop. The sliding-board was originally provided with a small grooved wheel receiving an endless cord, made of silk or fishing-line, which passed round the grooved milled-head of the fine adjustment of the microscope. When the sliding-board was returned to the median line of the apparatus, the milled wheel, connected with the fine adjustment, impinged upon the wheel of the long focussing rod. The latter was provided with an india-rubber tire, which gripped the teeth of the milled wheel, and thus the long focussing rod was placed in connection with the fine adjustment of the microscope. I now dispense with this arrangement, as I believe it to be a mistake to strain the objective by having the screen at a greater distance from the object than, say, thirty inches, and, with that distance of screen, one can easily move the fine adjustment with one hand, while holding the focussing glass in the other.

In addition to the low power objectives, I have worked principally with $\frac{1}{12}$ and $\frac{1}{18}$ hom. imm. by Zeiss, and a $\frac{1}{25}$ hom. imm. by Power and Lealand.

In the high-power objectives of these makers, the best visual focus was found to coincide with the best chemical focus. This is not the case with the high-power objectives of some makers, nor, as a rule, with any low powers. They must, therefore, be corrected specially for photo-micrography. This can be effected by the addition of a supplementary lens. To test an objective in this respect, a plate should be exposed when the image is sharpest on the screen, and two other plates when the image is slightly out of focus, by turning the fine adjustment so as to withdraw the objective, and then again to approximate it.

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* The description which here follows is drawn from my recent work, "Photography of Bacteria." H. K. Lewis, 1887.

Should it happen that when the visual image is sharpest a blurred photograph results, and when the image is blurred we get a sharp picture, a lens giving such results can be employed without correction, by ascertaining empirically how much the fine adjustment must be moved in order to get the chemical focus. But this will not be found to be nearly so satisfactory as having the lens corrected once and for all, or employing a lens in which no such correction is needed.

Of equal importance to the objective is the sub-stage condenser, and this, for the best results, must be provided with arrangements for focussing and accurate centering.

For illumination I have chiefly employed the oxyhydrogen light, which can be used without the interposition of a mirror in either position of the apparatus. In the horizontal position a paraffin lamp may be employed by simply removing the lantern and substituting the one for the other; but to employ this illumination when the apparatus is vertical would obviously entail another arrangement. It would in this case be necessary to adjust the mirror of the microscope, and to place the lamp in such a position that the light would be reflected in the ordinary way.

If the paraffin lamp be preferred, it should be provided with a large broad wick and a metal chimney. The burner may be made to revolve, so that either the edge or the flat of the flame may be utilised. The metal chimney has an aperture in front, giving exit to the rays of light, which is closed in by a slip of glass. The glass is very liable to crack when exposed to the full force of the flame, and it is as well, therefore, to be provided with a stock of glass slips, which have been annealed by being enveloped in a cloth and boiled for two or three hours.

The electric light and magnesium light have been employed with equal success by Woodward and others; but I have, so far, been so satisfied with the oxyhydrogen light, both for taking direct pictures and for enlarging, that I have not deemed it worth while to substitute any other. I more frequently employ it than the paraffin lamp, partly on account of the diminished time in exposure, especially when employing very high powers; this is of great importance where there is likely to be vibration from passing traffic. With rapid plates and the highest powers, the exposure has only been two or three seconds, whereas with the paraffin lamp it may vary from three to ten minutes, or even longer.

The illuminating apparatus here shown consists of a lantern which not only moves together with the microscope on the central sliding-board, but can be moved independently to or from the microscope, and be clamped with screws at the requisite distance for obtaining the best illumination. The lime-cylinders should be of the best quality, of hard lime. Oxygen should be suplied preferably in a compressed state in iron bottles. Not only are the bottles much less cumbrous than the bags, but a small quantity of gas can be used, and the residue left for an indefinite time, and is always at hand to be turned on when required. On the other hand, the retention of unused gas in the bags is liable to cause corrosion, owing to the impurities which are carried over in the manufacture of the oxygen.

I employ a half-plate camera, which is mounted upon a sliding platform. This admits of the camera being pushed up to the microscope when it is in the long axis of the apparatus, so as to make a light-tight combination. The opening occupied in an ordinary camera by the lens can be shut off by means of an internal shutter, which is opened and closed by turning a screw at the side of the camera. The dark-back is provided with plate-carriers, so that either half, quarter, or lantern-size plates can be employed. It is found convenient to have two or more dark-backs, so that several plates may be exposed without re-arranging the light for each exposure.

(*To be continued.*)

WINFIELD MANOR IN DERBYSHIRE.

BY RICHARD KEENE.*

Though these ruins have enough of beauty in themselves to please the photographer, yet I have thought a little information regarding their origin and past history cannot but enhance their attractions, and with this view have put together the following notes.

Winfield Manor, fourteen miles from Derby, is perhaps one of the finest memorials of ancient architectural splendour we have left, and though shorn of its glory, still presents to the appreciative eye many points of beauty worthy of the canvas or the camera. To the poet, historian, or archæologist, the ruins of this fortified mansion are full of interest, carrying him back to scenes of chivalry and feudal power. I must only glance at its past history; its present condition you have had ample means of studying and enjoying. Winfield Manor boasts of a green old age, and we know but little about it till the time of William the Conqueror, who gave this, with other manors in Derbyshire, to his natural son, William Peverel. Robert de Heriz, Earl of Brittany, held the manor under Peverel, and it continued in the possession of this family for many generations after the flight of Peverel and the forfeiture of his lands to Henry II. Richard de la River married the heiress of the Heriz family, and was the next owner, and his daughter Margaret became the wife of Roger Bellars, sheriff of Nottingham and Derby in the reign of Edward III. Their daughter, also named Margaret, married Robert de Swyllington, Knight, and her father gave her the manor of Winfield with other lands of her mother's. This last-named pair having no offspring, it was found by an inquisition taken at Derby, Oct. 25, 8th Henry VI., that the property belonged to Ralph, Lord Cromwell, of Tatershall, descended from the Bellars family, and cousin of Margaret, wife of Robert de Swyllington. A lawsuit was instituted, which ended in a compromise, the Manor of Winfield remaining in the possession of Lord Cromwell. This Lord Cromwell was a man of great importance in his day, holding many high and lucrative offices. He set to work building this magnificent place on the site of a more ancient structure. It was, however, completed by John Talbot, second Earl of Shrewsbury, to whom he had sold the reversionary interest in the Manor, and in whose family it remained till 1709.

Four and a-half centuries have passed since these walls were raised, and yet they are as strong as ever, where time only has affected them. But war and wanton destruction have been at work—the marks of cannon balls can yet be seen on the walls, and the hideous house in the valley below was built from the ready-worked stones of this structure.

In 1569 Mary Queen of Scots was brought here a prisoner from Tutbury Castle, where she had resided for more than a year previously, a prisoner of State, in the custody of George Talbot, sixth Earl of Shrewsbury, the fourth and last husband of the celebrated Bess of Hardwick. For nine or ten years was the beautiful Queen of Scots in the care of this earl at divers places, and between his jealous wife and Queen Elizabeth he led a most miserable life. The memory of the hapless queen will haunt the mind as one wanders amongst these ruins grey, and ponders over the times of old. How she and her maids spent their time in needlework, when "the diversitie of the colours made the worke seme lesse tedious;" how attempts were made to liberate her by young Anthony Babington, of Dethick, and other conspirators who met at his house, only four miles away; of their failure, trial, and barbarous execution. These plots of Mary's friends hastened the time of her own mock trial and execution, for Elizabeth deemed her life and throne insecure, and was thus led to sign the death-warrant which will ever be a blot on her memory. No less than two hundred gentlemen, yeomen, officers, and soldiers were employed in the custody of Mary, at Winfield. Her own establishment at this time included five gentleman, fourteen servitors, three cooks, four boys, three gentlemen's men, six gentlewomen, two wives, and ten wenches and children. They consumed a large quantity of wine, and no wonder her guardian was embarassed in providing for so large an addition to his household. The suite of rooms on the west side of the inner court, and connected with the great tower, are said to have been those occupied by the unfortunate queen.

During the civil wars, Winfield Manor was the scene of many struggles between the Royalists and Parliamentarians, and several hotly-contested engagements took place, first one party, and then the other, gaining the ascendency. In the last siege, Sir John Gell planted his cannon on Pentridge Common, on the opposite side of the valley, but could not effect a breach. Coming within nearer range, and being strengthened by a division of the Earl of Manchester's army, the gallant defenders were obliged to surrender, their governor, Colonel Dalby, having been killed during the conflict. On the 23rd June, 1646, an order in Parliament was issued directing that the place should be dismantled, and from this time it was allowed gradually to fall into decay, the dilapidation which strife had effected being hastened by some who looked on the pile only as a heap of quarried stone, to be used as required for any and every purpose.

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* Read before the Derby Photographic Society.

The sun-dials you see about the ruins were placed there by Imanuel Halton, who purchased the Manor in 1678. He was a man of studious and retiring habits, pursuing the studies of music, mathematics, and astronomy. He took up his abode here, and did not scruple to pull the place about to make it to his own liking. A successor of his did far worse in removing the stones to build the ugly house I mentioned before. The ruins are, however, now carefully preserved from further demolition, and will long remain to adorn the landscape and afford interest to the antiquary and lover of history, subjects for the painter and photographer, and pleasure to the thousands who seek for recreation in visiting the ancient landmarks of their beautiful country.

Once—
"These now deserted rooms were wont to ring
With laughter and the bacchanalian song;
And startled echo flew from wing to wing,
Repeating sounds of mirth with mimic tongue."
Now—
"These spacious rooms are silent as the dead:
Without a sound my footstep lightly falls;
A grassy carpet on the floor is spread,
And echo slumbers not in roofless walls."

I have made my sketch as concise as possible, and have not attempted any description of the ruins by which we are surrounded; their great artistic beauty you will all acknowledge, but should any of you wish to know more about the building itself, I will gladly be your guide.

Notes.

As a comment upon a letter in the News of last week, in which letter Voightlander bitterly complains of the use by others of his name "Euryscope," we may point out the way in which a Paris manufacturing house of high reputation introduces lenses made after the *fashion* of the Euryscope. The house in question—Laverne and Co., of Rue de Malte—makes imitations of the Voightlander lens, but loyally acknowledges that the lenses are imitations.

Here is the wording of the announcement in a monthly trade review, issued by Laverne and Co.:—"Panorthoscopic: an imitation of Voightlander's euryscope. Is a rectilinear aplanat of a special combination for instantaneous views, groups, portraits, and reproductions; angle of 60° to 85°. . . For vigour, depth, and finesse is equal to the article copied."

There is a good deal of straightforwardness about this announcement. In the first place, the distinctive title of the instrument is in no sense a piracy upon Voightlander's title, and due credit is given to Voightlander for introducing the Euryscope; moreover, the imitator, by implication, admits that the best thing he can say of his "Panorthoscopic" lens is, that it is equal to the genuine Euryscope made by Voightlander.

For real nonsense writing there is nothing like the Society Journal. One of these productions professes to be greatly shocked at the photographs of Mrs. Brown Potter, where she is represented with her head against the light, and enquires whether she is aware that "the glory round her head is giving great offence." Solemnly the writer goes on to say that "it is easy to believe that Mrs. Brown Potter and her photographer were innocent of intending anything blasphemous, and merely thought, by the arrangement of sun's rays behind the lady's head, they were introducing a pleasing and becoming novelty; but the fact remains that a great many people have fancied that the American actress is aping, if not the Virgin Mary herself, at least the pictures of her." The journal in question surely must give the public credit for possessing more stupidity than they possess.

The early photographs have much to answer for. Somehow they have contrived to invest the public with an unwholesome horror of photography, and having one's portrait taken is equivalent to something very gruesome and uncomfortable. How else could such a comparison as this occur to a lady? She was walking in the newly opened Terrace Gardens at Richmond, where a number of worn-out boats have been stuck up as arbours. These abodes of bliss are very narrow, and just hold one couple. "Dear me!" she exclaimed, as she passed one which was tenanted; "they look as if they were sitting for their photographs in a coffin!" It was a grisly simile, but not at all inapt.

It is difficult sometimes to decide between necessities and luxuries. In a case of bankruptcy of an Oxford student, which came last week before the Registrar of the Birmingham Bankruptcy Court, it was stated that one of the items for which the bankrupt had got into debt was photographs of the principal actors and actresses of the day. The bankrupt considered that he was justified in incurring this expense, and therefore, from his point of view, these photographs were necessities. The argument is a novel one, and the opinion of the Court on the matter would have been interesting. Unfortunately, this was not given.

Harry Furniss has an article in last month's *Magazine of Art*, in which he alludes to the difficulty of procuring a person's photograph when it is needed for purposes of publication. The process is often like this. He writes to the man, and the answer he gets back is that the writer is sorry he cannot oblige, but the fact is he hasn't got a recent photograph, and the only thing he can do is to send one from his wife's album. This was taken some years ago, but no doubt it will do, only the artist must remember to make him stouter, and with a little more hair on his face. The artist attends to the instructions and does his best, but hears afterwards that his efforts have not given satisfaction. The reason is disclosed to the reader in three sketches. The first represents the original photograph, the gentleman slim, and attired in the pegtop sleeves and trousers of 1860. The second is the artist's elaboration from the instructions received, with more hair, and a little stouter. The third is the original as he really is—a gentleman of portentous stomach, bald, and with an enormous beard.

It is quite true, as Furniss points out, that very few people of middle age can furnish you with a photograph. We could cite numerous instances where artists have been put to no end of trouble to obtain photographs, and the fact seems to show that nowadays, sitting for one's photograph is the exception and not the rule. The most aggravating case we know was where an artist wanted to draw the portrait of a well known musician. The latter had a photograph and promised to send it. Days went over, the photograph never came, and at last the artist had to draw the likeness as best he could, from a verbal description. When the paper came out, a copy was sent to the musician, who forthwith sent back his photograph, hoping it was in time for the artist to make a few alterations in the printed portrait.

Newspaper and periodical competition is so keen now-a-days, any attraction is gratefully seized upon by editors. The latest novelty is that put forward by the *St. Stephen's Review*, which promises to publish the photographs of every guesser of puzzles in its columns for a given period. This is celebrity on a very small scale. As the *St. Stephen's* was started for political reasons, one would have thought more capital could have been got out of the party which supports it. For instance, there is the energetic lady who devotes her time to working at elections in the cause of Conservative candidates. In some of the West-End shops the photograph of the lady in question, sitting in a dog-cart drawn by a pony, may be seen. Underneath is the inscription, "How I helped to win the Chelsea election." Since then she has figured actively at contests all over the country, and is becoming quite a well-known character. Then the portrait of the persistent "heckler" might be given, which could be followed by that of the funny man who is invariably to be found at every political meeting, and either assists or baulks the orator just as the latter happens to have readiness of retort or not. The Primrose dames who have specially distinguished themselves by winning over tradesmen, or boycotting them, would make a very interesting series. On the whole, the *St. Stephen's* would have ample material to draw from.

Professor Virchow has been commissioned by the Prince Imperial of Germany to examine the archives of the Hohenzollerns for the purpose of finding out whether any hereditary peculiarities can be discovered in their physique. How the Professor is going to do this, and what data he has at his disposal, are not stated. It is a task in which Francis Galton would especially delight. A contemporary remarks that the Stuarts are known by their noses, the Hapsburgs by their nether lips, the Bonapartes by their massive foreheads and small delicate white hands, the Royal Family of England by their low retreating foreheads and tendency to corpulence. This judgment has, of course, been arrived at by the statements of observers, and from the study of any portraits which may happen to exist. Judging, however, by the portraits extant of the Queen, artists patronised by Royalty are totally unreliable. Our descendants, who will be able to form their opinion of the present generation of princes from photographs, will have much better ground to go upon in the matter of comparison.

There is sometimes a little difficulty in displaying photographs of the panel and promenade size to advantage at home. Photograph stands are, of course, to be had in endless varieties, but they are not entirely satisfactory. They often cumber the table, and have a knack of getting in the way, and of collapsing at the slightest encouragement. The more elaborate contrivances are free from these objections, but then they are very expensive. The *Journal of Decorative Art* comes to the rescue of those with artistic tastes and slender purses, and suggests a home-made folding screen which can be adapted to show photographs of any size. Details are given which are very easy to follow, and have the advantage that the photographs are movable, so that the subjects can be changed. If the screen be covered with a paper of a tone suitable to photographs, it seems to us that this would be a very excellent method of exhibiting the portraits of one's family and friends with good effect.

Review.

Wilson's Quarter Century in Photography: Forming a Complete Textbook of the Art. Price 16s. By Ed. L. Wilson. (*New York*, 1887, *published by the Author*, 853, *Broadway*.)

We have here by far the most complete, handsomely got up, and comprehensive handbook of photography that has been issued in the English language—a book which every photographer, whether professional or amateur, should make a point of adding to his library. We understand that arrangements are being made for publishing the work in England, but, in the meantime, copies may be ordered from a foreign bookseller—as Trubner, of Ludgate Hill; Nutt, of the Strand; or Williams and Norgate, of Henrietta Street, Covent Garden.

The author—who evidently wished, above all, to make a thoroughly practical book—wisely refrains from writing a long chapter on the history of photography, but the four pages devoted to this subject are concise and to the point. The theory of photography, light, and the first notions of what the camera is, are also briefly dealt with; after which we come to rather over forty pages devoted to the study of lenses and diaphragms; this subject being treated of in such a way as to tell the reader just what he is likely to want to know. After this comes a main feature of the book—namely, the sections devoted to what may be roughly called studio practice. The construction of the glass house is first dealt with, both as regards general design and as to detail, after which studio accessories and fittings are treated of, and finally, the various styles of camera and camera fittings are described. The chapters on studio practice alone will repay the professional photographer for buying the book.

The matter referred to takes us about one-fourth through the work, and the rest is devoted to the application of art principles, out-door operations, exposure, chemicals, dark-room contrivances, negative making (wet), negative making (dry), negative making (paper and film), retouching and doctoring the negative, printing on albumenized paper, various printing processes, colour-sensitive photography, photo-engraving, lantern slides, and transparencies.

Wilson's hand-book is illustrated with about two hundred and fifty engravings, and as regards print, paper, and binding, deserves no less praise than on account of the usefulness of the matter.

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Patent Intelligence.

Specifications Published.

7,790. Alfred Julius Boult, of 323, High Holborn, in the County of Middlesex, M.I.M.E., for "Improvements in photographic apparatus."—(Communicated from abroad by Henry Smith Crocker, of San Francisco, in the State of California, one of the United States of America, Merchant.—Dated 28th May, 1887.

This invention relates to improvements in apparatus for taking photographs by which each sensitised plate has its portable folding camera attached, and the use of lenses for focussing the picture is obviated.

The objects of these improvements are to make each sensitised plate a complete photographing camera without adding greatly to the weight or bulk of the plate, and which will be ready for immediate use at all times and places; also to greatly lessen the cost of portable photographic apparatus for popular use, and facilitate their manipulation by the amateur and inexperienced, who may by their use always obtain a good image, as no focussing of the apparatus is required.

These objects are attained by the following means, which are illustrated by the accompanying drawings.

In a light-tight folding box made of paper or other suitable material a diffraction image is produced upon a sensitised plate by admitting the light which is reflected from the object or objects being photographed through a minute aperture in the apparatus placed at a suitable distance from and opposite to the surface of the plate, the size of the picture being varied by the distance at which the sensitised plate is from the aperture relatively to the distance of the aperture from the objects being photographed, the image under the varying circumstances remaining always equally clear and well defined.

Figure 1 shows a longitudinal cross section of the complete apparatus, the general appearance and construction of which resemble the ordinary photographic camera, with the sensitised plate in position for receiving an impression, but minus the usual tube and lens, their place being occupied simply by a small thin diaphragm D in the front piece, B having a minute central aperture or perforation A of about one hundredth of an inch in diameter, through which the light is admitted to the sensitised plate, P.

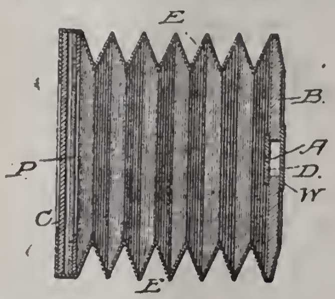


Fig. 1.

The stiff back C serves to protect the plate from mechanical injury, and excludes the light from the rear.

The sensitised plate being permanently fixed, the removal of said plate necessitates the destruction of the entire apparatus. Such being the case, it is readily seen that each apparatus is complete in itself, and can be used but for one operation. The folding portion E, made of suitable flexible material for excluding all light, enables the front part, which carries the visual aperture, before described, to be withdrawn from near the surface of the sensitised plate to the limit of extension of the folding part E, by which means the size of the photographic image is regulated. When not in use the aperture in the front is covered by an adhesive wafer, W, which serves to exclude the light.

Figure 2 shows the apparatus in position for taking a photographic impression, the folding part distended, and the wafer removed from the front or visual aperture. Figure 3 shows the appearance of the apparatus when closed for transportation before and after use.

Having now particularly described and ascertained the nature of the said invention as communicated to me by my foreign correspondent, and in what manner the same is to be performed, I declare that what I claim is:—

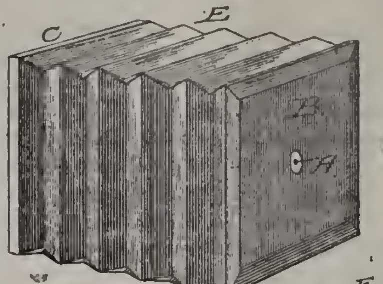


Fig. 2.

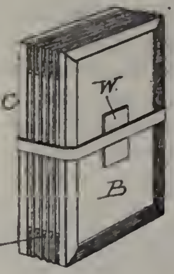


Fig. 3.

A folding extensible light-tight box having a small aperture at the front and a sensitised plate or film permanently fixed to the opposite end, so that its removal necessitates the destruction of the box, together with a removable adhesive patch or wafer for closing the aperture.

7035. Johannes Gaedicke, of 74, Ritter-strasse, of Berlin, Chemist, and Adolf Miethe, of the town of Potsdam, in the German Empire, Chemist, for "An improved magnesium light for photographic purposes."—Dated 13th May, 1887.

Our invention relates to an improved magnesium light for photographic purposes, and has for its object the removal of those difficulties which have hitherto prevented the general adoption of the same for photographic purposes, notwithstanding that its eminent value as an artificial source of light is generally recognised. In fact, experience proves that for momentary photographs or pictures produced in a fraction of a second, it is a valuable substitute for either the electric or daylight, but for several reasons these advantages could not be turned to practical account. This may be explained by the fact that it has been the practice, hitherto, to burn the magnesium in lamps, in the form of thin ribbon or wire, but it was found to be a most difficult matter to determine the proper "exposure." Another difficulty arose in the burning of the wire itself, as neither the method above mentioned, of burning the wire in lamps, or of burning the same uncovered, proved suitable for employment in the atelier, for several reasons; amongst others, that the latter portion of the wire was not consumed rapidly enough, that the wire was with difficulty ignited, but more especially because the products of combustion were afterwards to be disposed of. The action of the dazzling rays of the magnesium light on the object was, however, a sufficient reason why the same was not employed for photographic purposes. The various improvements invented for the purpose of removing these difficulties have not attained the desired result. According to our invention the magnesium is no longer used in the form of a thin ribbon or wire, but as a fine powder, which is mixed in a certain proportion with other bodies which readily give off oxygen (known to intensify the magnesium light), and also simultaneously mixed or amalgamated with such bodies as accelerate the combustion of the mixture. Such substances or bodies are, for example, chlorate of potash, prussiate of potash, sulphurous or other combustion materials. Whereas prussiate of potash exceedingly accelerates the combustion, the chlorate of potash, on account of its containing a large amount of separable oxygen, performs the very essential function of increasing the temperature to such an extent that the radiating light and the action of the magnesium is greatly intensified. The combustion of the mixture specified in the present specification lasts from about $\frac{1}{30}$ to $\frac{1}{50}$ of a second. It must here be remarked that although the magnesium light, prepared according to our invention, possesses several hundred thousand candle power, yet it is not possible for the effect of a flash to be so powerfully felt that a reaction of the "model" could take place.

This is explained by the fact that the time the flash takes to find its way from the sensitive nerves to the central organ, and from thence back to the operative nerves, is much longer than the limit given above for the burning of the powder; and even if the "model" should move, this movement could only have taken place after the photograph or picture was already taken or completed. Our said improved magnesium powder or mixture is of great value for the purpose in question, because the burning of the same, when ignited, takes place without any explosion whatever, expanding gases not being objectionably produced. The rapidity of combustion depends considerably upon the fineness of the magnesium powder and other ingredients, and also upon the degree of their mechanical intermixture. The most suitable mixture for this purpose consists of

Chlorate of potash	12 parts
Magnesium powder	6 ,,
Prussiate of potash	1 part

Or,

Chlorate of potash	24 parts
Magnesium powder	12 ,,
Amorphous phosphorus...	1 part

The chlorate of potash is first pulverised in a suitable mortar' and the other substances—namely, the magnesium powder and prussiate of potash—then added. The best results are attained by mixing the substances together upon a smooth sheet of paper by means of a wooden or horn spoon, or by rolling the substances together until a fine grey powder is produced, which serves thus for the magnesium light. The magnesium powder so prepared can be ignited by means of an electric or other spark, and burns with a short flash. By selecting a suitable method of burning the magnesium powder, a light may be produced which can be employed to great advantage for other purposes, besides those of instantaneous photography. Our latest experiments have proved that the introduction of substances or bodies which show certain coloured lines in the spectrum of the Bunsen burner make the magnesium light much more effective for these colours. For these reasons we provide the previously described magnesium mixture with an addition of sodium, stronthium, calcium, lithium, tallium, barium, and other salts, in order that the magnesium light thereby produced may be made more effective for yellow, red, or green colours. The proportion of these additions of light colouring bodies can be varied from a minimum quantity upwards, to about ten per cent. of the mixture, but it is not advisable to take a larger quantity, because they would affect the temperature of the combustion, and also decrease the effect of the light.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim and desire to secure by letters patent is:—

1. The employment of a mixture of magnesium powder with oxygen yielding salts, as for instance chlorate nitrate and other salts, as well as with substances that accelerate the combustion such as prussiate of potash, amorphous phosphorus, sulphurous and other combustive materials, pine soot, &c., for instantaneous photography, and for producing a momentarily intense light, substantially as described in the foregoing specification.

2. The employment of light colouring substances, or bodies in connection with the herein described magnesium light, in order to make the light more effective for the corresponding colours, substantially as described in the foregoing specification.

11,231. Benjamin Joseph Edwards, of The Grove, Hackney, London, in the county of Middlesex, Photographer, for "A new or improved machine for cutting photographic and other glass plates," and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement, reference being had to the accompanying drawing, in which figure 1 represents a general view of a machine with table arranged for bisecting the plates, figure 2, a table arranged for cutting plates to sizes as hereinafter explained, figure 3 a detail of the table shown in figure 2, and figures 4 and 5 details of the diamond carrying arrangement.

Similar letters refer to similar parts throughout.

The tables upon which the sheets of glass to be cut are placed one at a time are marked AA¹, and I make the surfaces of these tables of two slightly different levels on either side of the line of cut to facilitate the snapping of the glass as described hereafter. At one side of the tables I hinge a flap B, one side *b* of which forms a guide for cutting, and along the opposite side of the tables I form a raised stop C, upon which the flap B rests when in use just clear of the sheets of glass to be operated upon. At the end of the flap I form a second smaller flap D, which may be hinged or made of some suitable flexible material, and on the undersides of these flaps I form suitable projections, *c c*, which can be pressed upon the glass on either side of the line of cut, and thus by the aid of the inequality of the surface of the table, snap the glass in order to effect complete separation.

When the sheets of glass are to be bisected, I fit a right and left-handed screw E in fixed bearings below the table A as shown in figure 1, and upon it I arrange nuts F, equidistant from the centre, which travel horizontally to and fro along the screw when turned by the wheel or handle G, thus pushing the sheet of glass into position and gripping it ready for cutting in the exact centre.

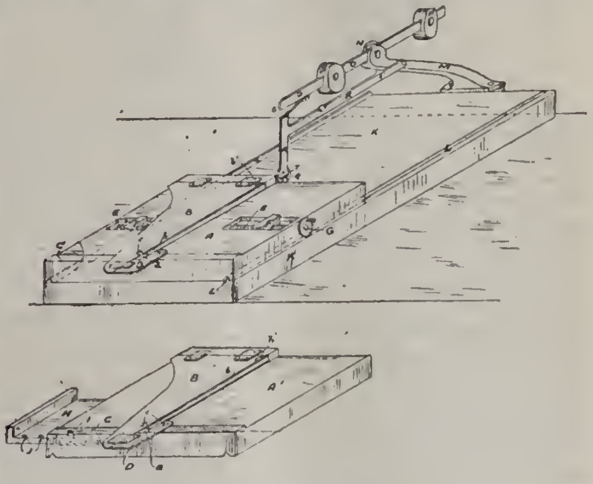
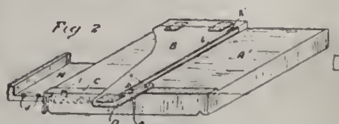
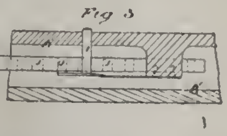


Fig. 1.

When the sheets of glass are to be cut to certain dimensions (not bisected) I make use of a similar platform or table A¹ as shown in figure 2, and on one side I fit a suitable sliding guide H, which may be adjusted for various sizes by means of a scale or by a spring bolt I, fitting into notches J, as shown in figure 3 or other convenient device. This sliding guide or fence H is set at right angles to the stop or rest C, against which the sheet of glass is placed, and the flaps B and D being also at right angles to the stop C, the sheet is cut square immediately on being placed in the machine without special adjustment.





By means of an ordinary hand diamond tool, drawn along the edge of the flap B, above described, the sheet of glass may be bisected or cut square to any required dimensions with great accuracy and rapidity.

As hand-cutting is liable to failure from inexperience, carelessness, and other causes, I provide a frame or baseplate K, which may be used in combination with the above-described tables A and A¹, which are made interchangeable to this frame or baseplate K. I fit parallel grooves or guides L, along which the tables A A¹, which are furnished with corresponding guides or projections, are made to travel.

At the far side of the frame K, I fix an adjustable standard or bracket M, and in its upper end I form adjustable bearings N, to receive a rocking arm or lever O, upon which the weights P P¹ may be adjusted to give any desired pressure on the diamond tool Q, which is secured, as hereafter described, in one end of a second lever R, hinged to the bracket M, as shown. I employ, by preference, two levers, O and R, of different lengths, and also a spring, S, as shown, working upon a leather pad on the top of the lower lever R, in order to prevent the ricochet which is liable to occur when the diamond first comes in contact with the glass; but I do not confine myself to the exact design shown, as springs may be employed in place of, or in combination with, the weights P P¹; and, further, the tool may be secured in the lever O, bent to suitable form for the purpose, and one of the weights or springs carried on the lever R, arranged to press on a roller on the lever O, or by other convenient device. As a guide and carrier for the diamond tool Q, more clearly shown in figures 4 and 5, I provide wheel T, which revolves on

Fig 4

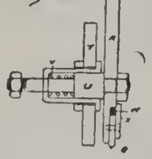
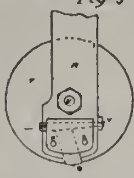


Fig 5



the pivot U attached to R, upon which it may slide; also a spring V, for the purpose of keeping it pressed up to the end of U, unless it is forced and kept in the position for cutting, as shown in the drawing, by the edges $b\ b^1$ of the flap B, which are provided for the purpose. I also employ a wedge W, and cap X, which holds the tool Q' and the wedge in position, and by the nut Y, I adjust the tool Q as desired.

The action of my machine is twofold—that is, it may be used for hand-cutting, or for cutting by means of the fixed tool, as shown. For hand-cutting I dispense with the frame K, bracket M and its attachments, and use only the tables A A^1. When I wish to bisect plates, I employ the table A shown in figure 1. I first lift the flap B, and lay the sheet of glass upon the table between the nuts F, and against the stop C. I then turn the handle G, which, by means of the screw E, runs the nuts along until they grip the glass in the exact centre, as described above. I then lay the flap B down, and draw the tool along its edge *b*; then, by pressing the projections *e e* upon B and D upon the glass, it is snapped, owing to the inequality of the surface of A, and the operation is completed. The only difference in the operation, when I wish to cut plates to certain sizes, instead of bisecting them, is that I employ table A^1 shown in figure 2, and lay the sheet of glass on A^1 against the stop C, and guide or fence H adjusted to any desired position as above described instead of regulating it with the nuts F. When I cut by means of the machine tool, I adjust the sheets of glass on A or A^1 as shown in figures 1 or 2, and having adjusted the diamond tool, I push the table along the guides L, and the glass is cut as the table is pushed.

In this case the operation is as follows. As soon as A or A^1 is started, the glass comes in contact with the wheel T, which lifts Q into position for cutting, and travels along the guide *b* during the cut. When the cut is completed, T runs up the incline d^1, shown on the smaller flap D, and the spring V shoots it over, so that as A is pulled back, T runs along on the top of B, carrying Q clear of the class altogether As it nears the end of its backward stroke it comes in contact with the inclined guide b^1, which presses it back and allows it to fall on to the surface of the table, and so leaves it in position for the next cut.

By means of the tables A or A^1 I am able to cut to size or bisect plates by hand with much greater economy and exactitude than by the usual method, and when the complete machine is used I can dispense with skilled labour, the work being carried on safely and effectively in the dull light required when the machine is used for cutting photographic plates which are sensitive to light.

The claim is:

1. The tables A A^1, in combination with the flaps B D, substantially as shown and described.
2. The tables A A^1, in combination with the flaps B D, and the nuts F, on the screws E, substantially as shown and described.
3. The tables A A^1, in combination with the flaps B D, and the adjustable fence H, substantially as shown and described.
4. The complete tables A A^1, in combination with the frame K, standard M, and rocking levers O and R, substantially as shown and described.
5. In a glass-plate cutting machine, the use of the adjustable diamond tool holder, substantially as shown and set forth.

11,365. **Henry John Cooke**, 7, Westminster Chambers, Westminster, Engineer, for "An improved portable photographic apparatus." Communicated from abroad by Mr. **Joseph Francois Fetter**, Engineer, of 34, Rue Delambre, Paris, France.—Dated September 7th, 1886.

A disc camera to be worn under the vest.

THE APPLICATIONS OF PHOTOGRAPHY IN ASTRONOMY.

BY DAVID GILL, LL.D., F.R.S.,[*]

Her Majesty's Astronomer at the Cape of Good Hope.

The reasons for the adoption of this plan were the following:—

The celebrated astronomer Argelander charted the heavens on this scale from the North Pole to the Equator, and the work has recently been extended to 20° south of the equator by Schonfeld, the pupil and successor to Argelander.

Argelander's *Durchmusterung*, as it is called, has furnished, ever since the date of its publication, the nomenclature of all the fainter stars employed in the daily operations of astronomy; it has furnished the working catalogues which are essential for the more exact determination of the places of all these stars; it has given us the first accurate data for determining the distribution of the stars according to magnitude and apparent position in the heavens, and is the first solid existing basis for founding any theory as to the constitution of the stellar universe. To complete the Durchmusterung for the remaining portion of the heavens was, therefore, the most pressing need of modern astronomy. I commenced the work in 1885 by the aid of photography. I hope in two or three years, if I have the honour of lecturing again in this theatre, I shall then be able to tell you that the work in question is finished.

I should here explain that mere pictures of the stars are of comparatively little value, or rather of about the same value to an astronomer, as a series of charts of parts of the world would be to a sailor if there were no lines of latitude or longitude marked upon them.

The every-day useful part of the Durchmusterung is the catalogue giving the positions and magnitude of all the stars. That work is rapidly advancing in the hands of my able and enthusiastic friend, Professor Kapteyn, of Groningen, who, with the aid of three assistants, has undertaken to devote five or six years of his life to the measurement of the Cape photographs and the computation of the results.

When this has been done, as I venture to think it will be within five years, astronomers will be in possession of that preliminary survey of the whole heavens which is necessary for the more refined and elaborate researches which must follow as results of the Paris Congress.

But to return to the work that was meanwhile being done in Paris by the brothers Paul and Prosper Henry.

These astronomers had been engaged since 1871 in the construction of charts of the Ecliptic by the older processes of observation, but when they reached that portion of the heavens where the Milky Way crosses the Ecliptic, the number of stars became so overwhelming, that the task of charting seemed almost too great for human patience and skill. But, fortunately, the time had come when dry-plate photography could be called into aid, and this aid was in the hands of men singularly competent to develop such an opportunity to the fullest extent. The brothers Henry had long aspired to be not only distinguished practical astronomers, but, following the traditions of Huyghens and the Herschels, they desired also to be the artists of their own optical means. Bound together by strong brotherly affection and common tastes, gifted alike with practical talents of a high order, and with an energy and determination of character that permit no obstacle to success, these men, thus happily united, have devoted the spare hours of their busy astronomical duties at the Paris Observatory, first to the study of optics, and afterwards to the grinding and polishing of lenses and specula, which have won for them a now world-wide reputation as opticians of the highest rank.

I had the pleasure a few weeks ago of visiting the modest workshop attached to their house at Montrouge, and I shall not soon forget that visit, nor the many lessons, moral as well as practical, which I learned.

Every detail of their process of working has been evolved by themselves; they employ no assistant, and their every appliance is simple and practical in a degree which I can only compare with the simple and practical character of the men who designed it.

Such were the men above all others to develop the application of photography to the charting of the heavens. They had high appreciation of the value of the work which they were about to undertake, they had the fullest knowledge of the requirements of the case, and they had the practical skill which enabled them to perfect the necessary apparatus. Their first attempts were made with a telescope of six inches aperture (the object-glass being specially ground for photographic work), and the tube was temporarily adapted to an existing equatorial stand.

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[*] Continued from page 429.

With an exposure of forty-five minutes, pictures of stars were obtained to the 12th magnitude, in which the star discs were quite round and sharply defined.

Fully appreciating the beauty of this result, and seeing its importance, Admiral Mouchez boldly faced many administrative difficulties, and accepted without delay the proposals of the brothers Henry to construct an object-glass of thirteen inches aperture, and about eleven feet focal length, as well as the offer of M. Gautier to mount the same on a suitable stand. The new instrument was mounted in May 1885. A photograph of the complete instrument is now on the screen.

Both from an optical as well as a mechanical point of view the new instrument was admirably adapted for its intended, work, and the results obtained by the brothers Henry, and rapidly published and circulated by Admiral Mouchez, at once astonished and delighted the astronomical world.

I now show a few of the more remarkable of these star pictures on the screen.

After such results as these there was no longer room for doubt or delay. The exquisite precision of these pictures, the sharpness and roundness of the images of the stars, and the results of actual measurement on the plates, proved that all necessary accuracy had been attained.

The means of rapidly obtaining the data for an accurate survey of the heavens on a very large scale were now within the reach of astronomers, and the time for decisive action had arrived.

The work, however, was too extensive to be undertaken at a single observatory, or even by a single country, and it was agreed on all hands that international co-operation was essential for its execution in a sufficiently short space of time.

I need not enter into the details of preliminary consultation or correspondence, but at last a time was fixed, and invitations were issued by Admiral Mouchez, Director of the Paris Observatory, under the auspices of the Paris Academy of Sciences, for an International Congress of Astronomers to be held at Paris.

A preliminary committee having arranged the general order of business, the Congress was opened on the 16th April, and its thoroughly representative character will be understood from the following statement of the nationalities of the members present.

France	20	Denmark	2
England and Colonies ...	8	Belgium	1
Germany	6	Italy	1
Russia	3	Spain	1
Holland	3	Switzerland	1
U.S. America	3	Portugal	1
Austria	2	Brazil	1
Sweden	2	Argentine Republic ...	1

Before the Conference, a great many people, I will not say astronomers, held that the chief object was to photograph as many stars as possible, and simply preserve these plates or issue photographic copies of them, so that astronomers of the future, by merely comparing one of these originals or copies with a similar photograph of the same part of the sky taken 50 or 100 years hence, would find out what stars had changed in position or magnitude, or whether any new star had appeared.

There is no doubt this was the view of the popular writers—it is very easily understood, and it appeals very directly to the imagination. Such a project alone would no doubt have had great importance, and would probably in the future have brought to light a great many very interesting isolated facts.

But for the broader and more refined purposes of astronomy, for the discussion of such great questions as the motion of the solar system in space, the common movement of large groups of stars, the accurate determination of procession, and the general refinement of astronomy of precision, these mere pictures would have no value.

It was essential for these larger and more permanently important ends that all data should be provided for the most refined determination of the *absolute* position of any star upon any plate. This view was endorsed by the Congress.

The objects of the survey of the heavens to be carried out were defined ultimately thus :—"To make a photographic chart of the sky for the present epoch, and to obtain the data for determining the positions and magnitudes of all the stars to the 14th magnitude," as that magnitude is at present defined in France.

At present there are no exact determinations of stellar magnitude to that order of faintness, and the considerations which really guided the Conference were, that stars which are called 14th magnitude are photographed by the Henrys with an exposure of about 15 minutes of time. With such an exposure the time required for the work contemplated by the Congress would not be too great, but to demand long exposures would lead to the loss of many plates by interruptions from clouds, &c., and would unduly prolong the time required for completion of the whole work. As it is, the number of stars photographed to 14th magnitude will number about 20 millions.

It was seriously urged that stars to the 15th or even 16th magnitude and higher should be photographed, but it was felt that there was real danger of failure in an attempt to do too much.

It no doubt produces a strong effect on the imagination to be told that astronomers are to be engaged on making charts of the sky which will contain 60 or 100 millions of stars, or photographing stars on their plates which cannot be seen at all in the most powerful telescopes. There is thus a strong temptation to yield to this demand for sensation, to produce a few astonishing plates with the loss of much precious time, and to sacrifice the real progress of astronomy to the love of the marvellous. Besides, what are you to do with pictures of 100 millions of stars when you have got them? What would be the use of pictures of all these stars, unless at some future time a sufficient number of astronomers were to arise to compare similar photographs, taken, say, one hundred years hence, with the photographs taken in our day? I am happy to think that the number of men who devote themselves to the pursuit of astronomy is on the increase, but I have no desire that the number of men in Great Britain who occupy themselves exclusively with astronomy will ever correspond with that in the floating island of Laputa, as described by Dean Swift, where all the men were exclusively occupied with astronomy, and had to be flapped on the head with little bladders containing parched peas to arouse them from their abstract occupations. And yet, unless something of this sort happens, I see no adequate prospect of the utilisation of pictures of 100 millions of stars.

The Congress, therefore, very wisely limited their chart plates to the 14th magnitude. But, as was well said by M. Bouquet de la Grye, it was not necessary to summon fifty or sixty astronomers to a Congress to arrange for taking mere photographs of stars—a number of photographers provided with instruments like the Henrys could have done all that without a congress. It was very strongly felt that the true *raison d'etre* of the Conference was to secure astronomical data, precise and exact as as the operations of astronomers should be.

Accordingly they resolved that —

"In addition to the duplicate series of plates giving all the stars to the 14th magnitude, there should be a series of plates of shorter exposures to insure a greater accuracy in the micrometric measurement of the standard stars, and to render the construction of a catalogue possible. The plates intended for the formation of the catalogue shall contain all the stars to the 11th magnitude inclusive." That is to say, it was determined to catalogue the abosolute places of stars to the 11th magnitude.

But no photographic plate of itself gives us any information about the absolute places of stars, though it gives the means to determine the relative positions of the stars on the limited area of each plate; you must trust to the old-fashioned meridian observations to determine the absolute places of the brighter stars on each plate, and then measure the position of the fainter stars relative to these standard stars.

Now if a plate is exposed long enough to get satisfactory pictures of stars of the 14th magitude, the images of the standard stars of the 7th, 8th, and 9th magnitude will not have the highest perfection, and consequently the places of the fainter stars cannot be measured relative to the ill-defined standard stars with the highest precision.

This will be evident if we examine actual photographs. One illustrates a short exposure, the other a long exposure. The short exposure gives sharp definition of the brighter stars, the long exposure brings into view a much greater number of stars, but the sharp definition of the brighter stars is completely lost. Therefore, if we wish to have determinations of absolute positions, we cannot have long exposures.

The meaning of the series of plates of short exposure, and showing stars only to the 11th magnitude, is thus explained :— Of stars to the 11th magnitude there are about 1½ millions in the sky, and a catalogue containing all these stars may be considered complete for the practical purposes of astronomy, because that magnitude is the faintest which can be measured with accuracy in the larger class of equatorials usually employed in working observatories.

I need not enter into detail about the technical means which are to be taken for eliminating the various sources of error, such as contraction of the photographic film in course of development and so forth. All these points have been considered by the Congress, or put into the hands of specialists when it appeared that any particular point required further special study, and they are too technical to be entered upon here. The chart of stars to the 14th magnitude will be of importance for many purposes, such as the search for minor planets, and the trans-Neptunian planet, for variable stars, and for data as to the law of distribution of stars of the higher order of magnitude. But I do not hesitate to say that the work which astronomers of future generations will be most grateful for, and which will most powerfully conduce to the progress of astronomy, will not be the chart, but the catalogue.

And now, ladies and gentlemen, I have dragged you through what I fear has so far been a weary account, to bring you to an apparently very uninteresting conclusion.

Catalogues and figures are not matters of much popular interest, and yet from such uninviting material has been built up the fair structure of the exact astronomy of the present day ; and out of such materials have been evolved the facts which appeal so strongly to the minds of men, and most strongly so, because men know that the conclusions rest not on mere imaginings alone, but on solid facts and figures also.

But now as to the practical execution of this useful work. After all the preliminary details of the operations have been fully discussed—when the instruments have been designed and made, and the mode of working and the methods of measurement and reduction have been devised, the practical execution of the work becomes one long round of routine labour, requiring skilled and careful superintendence, it is true, but still routine work of a very trying character.

Such work never has been, and never will be, the occupation of the amateur or single-handed astronomer. Essential as such work is to the progress of astronomy, it can only be executed at regular Government establishments, and therefore the conclusions of the Conference will have to be submitted to the various Governments, and the necessary votes of money must be secured. France has already definitely sanctioned the funds for four photographic telescopes of the kind which the Conference has decided to adopt for the work. And we cannot doubt that the modest claims which will be made on England's treasury for her share in this great work will be liberally responded to. But there are other applications of photography to astronomy which have a daily growing importance. It was desirable that the Conference should recognise this work, and establish relations with those engaged upon it. Accordingly the following resolution was passed :—

"The Congress expresses the desirability of there being a special committee which shall occupy itself with the applications of photography to astronomy, other than the construction of the chart. It recognises the importance of these applications and the relations which it is desirable to establish between different kinds of work. The Congress request Messrs. Common and Janssen to undertake the realisation of this proposition."

At first sight this may appear a somewhat barren resolution—but indeed it is not so. It must be remembered that the Congress was convened for the purpose of discussing a special object ; it had arrived at definite conclusions and recommendations in connection with that object, and it was felt that to go beyond that object might imperil the adoption of its recommendations by the various Governments.

But in the hands of men like Common and Janssen the resolution of the Conference is not likely to be a barren one, indeed it is certain that it will not be so, for they are already taking steps to unite fellow-workers in this field.

Their committee will associate itself with those who are engaged upon the charts, and will follow up in detail and with special instruments and methods the subjects of interest which from time to time will be encountered by the routine workers.

(*To be continued.*)

Correspondence.

H. P. ROBINSON AND AMERICAN APPARATUS.

Sir,—Mr. Ashman wants to know why I speak well of the "Wale" lens in some letters I am writing for American readers in an American journal, the first of which letters you have evidently thought would be of interest to English readers, or you would not have reprinted it, and for which republication I am not responsible. If you care to waste a short space in the gratification of Mr. Ashman's curiosity, I have no objection, and reply.

In writing of the apparatus and lenses of American manufacture, I said I had heard good accounts from different quarters of the "Wale" lens. I beg to assure your correspondent that this statement is absolutely true.

Mr. Ashman is probably overstepping his commission when he asks me to explain "the advantages possessed by these instruments over older lenses of the rectilinear type, such as those of Dallmeyer and Ross." He should try them for himself, as I have nowhere said they were superior to the lenses of these well-known and universally esteemed makers, whose instruments I have used for many years. Mr. Ashman seems also to want to get from me the different focal lengths of which the "Wale" lens is made. He ought to know that the proper people to apply to for details of this sort are the manufacturers of the lens—the Scovill Manufacturing Company, New York.

Thanking Mr. Ashman for his anxiety that I should be accurate, and you, sir, for devoting so much of your space to a subject which can have no interest for yourself or your readers. I am, yours, &c., H. P. Robinson.

Tunbridge Wells, July 30, 1887.

Sir,—Is it desirable to occupy the columns of the Photographic News with a reprint of, and criticisms upon, Mr. H. P. Robinson's letter on "Landscape Photography," which recently appeared in the *New York Photographic Times*, and which seems expressly intended for the American market? You have editorially observed that the *Photographic Times* is the property of the Scovill Manufacturing Company, and the recommendation exclusively of the apparatus supplied by that firm, including a lens that the writer does not profess even to have seen, indicates sufficiently, I should think, the character of the article.

If the Scovill Company think that their interests are advanced by laudation of their goods in the body of their journal, and if Mr. Robinson sees fit to supply the literary matter, surely that is their affair, and one with which English writers and readers need have nothing to do.

W. E. Debenham.

PHOTOGRAPHS OF LIGHTNING.

Sir,—I beg to call your attention to the fact of the engraving from our photo. of flash of lightning having been printed upside down in your issue of this week. Would you kindly inform your readers of this mistake? It might be misleading as to the direction of branches of said flash.—Obediently yours, H. Schleusner.

Antwerp, July 30th.

THE EURYSCOPE LENS.

Dear Sir,—In your last issue you published a letter from Messrs. Voigtlander and Son, of Brunswick, addressed to Messrs. Marion and Co., and forwarded by them to you, in which the first-mentioned firm charge us with "daring to usurp the word 'Euryscope.'" At the same time Messrs. Voigtlander and Son claim the word as their own, upon the strength of having used it since 1877.

We unhesitatingly say the accusation is not merited, since we have no wish to usurp the term, but regard it as one which has been applied to lenses of a particular type for many years past in this country.

Mr. John Browning, the eminent optician of London, informs us that he has employed the term "Euryscopic" for the last sixteen years.

Mr. J. J. Atkinson, of Liverpool, universally known as an authority upon the history of photographic instruments, says: "I have been familiar with the word 'Euryscope' in connection with photographic lenses (other than Voigtlander's) for over twelve years. The term 'Euryscopic' has been marked upon instruments in our own establishment for many years past."

After reading these facts, we think Messrs. Voigtlander and Son cannot fail to unite with us in regretting the publication of their letter, since it becomes evident that it is not Perken, Son, and Rayment who have dared to usurp the term "Euryscope," but Messrs. Voigtlander and Son who have dared to attempt to do so.

In our advertising "Optimus Euryscope, none genuine unless bearing registered trade-mark," Messrs. Voigtlander and Son state that we "desire to deceive the public, and mask our design." Our design is to call the attention of the public to the "Optimus" Euryscopes, as being distinctive from the Euryscopes of any other mark; and that there may be no possibility of deception, we long ago registered the word "Optimus" in England and abroad.

Some controversy arose on Messrs. Voigtlander and Son claiming the parentage of the optical form of this lens, and it was clearly shown at that time that the credit attaching to the invention rested on other shoulders. It may not be pleasant for Messrs. Voigtlander and Son to read that their second claim as to the name "Euryscope" is equally unwarranted; still, it is true.

Kindly favour us by inserting this reply in the next issue of your journal.—Esteem us yours faithfully,

Perken, Son, and Rayment (per J. Andrews).

London, E.C., 3rd August, 1887.

Proceedings of Societies.

London and Provincial Photographic Association.

The adjourned annual general meeting was held on the 28th ult., J. Traill Taylor in the chair.

The report and balance sheet read, set forth that much useful work had been accomplished, and that there was a balance of £9 4s 9d. to carry forward.

The following is an abstract of the Hon. Secretary's report.

"Another year has passed in the history of the Association, confirming a further period of usefulness and prosperity, proved by the well attended meetings each week, the steady accession of members throughout the year, together with the balance in the hands of your treasurer.

"Although no new photographic process has been developed during the past year, the applications of photography are so manifold, and the experience of its workers so varied, that subjects for debate and discussion are regularly brought forward at each weekly meeting, and however apparently unimportant the subject may appear, receives an equal share of attention with questions of larger import, the most trivial subject frequently leading to an interesting and instructive debate. How much of the enormous advance photography has made of recent years is due to Society discussions and organisation is not easy to determine. Photography as a veritable handmaid to nature, science, and art now plays no unimportant part in every day life. Frequently a natural desire arises on the part of the tyro for a more extended and intimate knowledge of the chemical changes and combinations that take place at every stage of development. It is here that a Society of this kind fills the want thus created. A commencement with a hobby leading up to the study of the highest branches of science and art may not unfrequently be directly or indirectly traced to the instrumentality of Society discussions. During the past season, many excellent and interesting demonstrations have been given and papers read.

"The most notable incident of the past year has been the formation of the Photographic Convention of the United Kingdom, which has been attended with the happiest results, and is destined to have a direct influence in the advancement of photography. Being associated and interested in its development and progress, the members of this Association may look with pardonable pride upon a movement that gives every promise of leading to many important results. An exhibition of pictures taken by members during the Convention was subsequently held. Between two and three hundred prints were exhibited. These were chiefly in platinotype and silver. Paper and glass negatives, together with stripping films, were each represented, and afforded ample opportunity for an examination side by side of the results from these several processes. The exhibition proved very attractive, and created a considerable amount of interest among the members and their friends.

"That the future position of photography among contemporary arts and sciences is assured, may be gathered from the fact of its recognition for the first time in its history by the British Association last year. The successful meeting of the Photographic Convention held just previously at Derby may, however, be in some measure responsible for this. The great popularity of the optical lantern remains unabated. It has now become firmly established as an indispensable accessory with all photographic societies. Scarcely a single branch of science or art that does not rely on the invaluable aid of the lantern for illustration. This has not been without its influence in creating a desire for greater perfection of transparencies. The past season has consequently witnessed lantern displays of a very high standard of merit. Periodical exhibitions with the optical lantern and oxyhydrogen light have been held, bringing large attendances of members, at which slides of great technical excellence—the work of the members—were shown on the screen. Keen interest was evinced in the instructive nature of these displays.

"The entirely social element of the Association has been fully represented by the *soirée* and smoking concerts held during the winter season organised by your Honorary Secretary. The large and enthusiastic audiences attracted on each occasion abundantly proved the popularity and enjoyable nature of these evenings. The annual dinner by general consent was held in November instead of July as heretofore, and was more largely attended than at any other previous year. Opportunity was taken to present your Hon. Secretary with a very substantial recognition of his past services in the interest of the Association generally. The testimonial—a handsome binocular microscope, by Ross—was worthy of the Society, and appreciated and valued in every sense by the recipient. The members have had every cause for congratulation in the past, at the same time the future must not be forgotten. The Association has attained a high position; its proceedings are read with wide-spread interest, and frequent testimony has been rendered to the general popularity of the Association."

The progress made by the sub-committee appointed to consider the revision of the rules was reported upon by the Hon. Secretary, and a decision in favour of electing a committee for one year, as an experiment, arrived at.

The election of officers then took place, with the following result:—

Trustees—J. Traill Taylor, J. B. B. Wellington.
Treasurer—W. H. Prestwich.
Curator—A. Haddon.
Hon. Secretary—J. J. Briginshaw.
Committee—W. M. Ashman, F. A. Bridge, E. Clifton, C. G. Collins, H. M. Hastings, A. L. Henderson, A. Mackie, H. M. Smith.

The Chairman passed round a negative in which a flare spot of magnitude was shown. An 18-inch focus lens used in a tube constructed for a 12 inch lens gave the result; but when the diaphragm was placed at a greater distance the fault disappeared.

Two questions were then dealt with, one asking the best test for silver in the whites of a silver print, and the other referring to spots in gelatine films.

With regard to the first, the Chairman said that sulphuretted hydrogen was suitable; and with respect to the second, W. E. Debenham, in a speech of some length, showed the necessity for thorough fixation.

In a negative shown by A. L. Henderson, a number of the well-known red spots which sometimes form during printing had been removed by the action of mercuric chloride; but those portions of the plate were afterwards perfectly transparent.

The Chairman said that a flashing light had recently been patented by J. Gaedicke; but he remembered the circumstance of such an arrangement being brought under the notice of the South London Photographic Society quite twenty-five years ago, and a description would be found in the reports of the journals of that time.

Birmingham Photographic Society.

The monthly meeting was held in the Technical Schools, Bridge Street, on the 28th inst. (W. J. Harrison in the chair), when A. Atkins, S Baxter, C. F. Jarvis, and R. W. Wareham were elected members.

A number of exhibits were shown, including prints from Messrs. Harrison and Reilly, the former of whom showed Scovill's whole-plate camera fitted with Eastman's roller; J. Iliffe, a capital washing tray by Wakefield; and F. Reilly a very useful combined rule, square, and spirit level.

The Chairman gave an account of the Glasgow Convention, and highly praised the arrangements and reception he and others received during the week at Glasgow and Edinburgh, and hoped the whole of the members would combine to give the Convention a hearty welcome to Birmingham next year, and endeavour to make it a genuine success.

Derby Photographic Society.

The members had an excursion to Winfield Manor on Saturday last, under the leadership of Richard Keene, who read a paper (see page 487) giving the history of the Manor House, which is a magnificent old ruin. There was a good number of members present, and about thirty plates were exposed. The next excursion will be to Norbury on August 6th.

Liverpool Amateur Photographic Association.

The usual monthly meeting was held on July 28 at the Royal Institution, George H. Rutter in the chair.

After exhibition of apparatus and prints, and reports of excursions,

A. W. Beer read the paper of the evening—"A Few Old-Fashioned Notes on a Modern Error; or, Humour the Plate and Save the Negative," in which he strongly advocated slow development. He pointed out whilst plates exposed under "perfect conditions" were easy enough to develop, using any plate and any developer, that many plates were lost through the amateur exposing a series of plates under varying conditions, and attempting to develop them all in the same manner. He strongly advocated the use of what is known as the American Standard Developer, composed as follows:—No. 1. Three ounces of ferrocyanide of potassium, three ounces of pure carbonate of potash, three ounces of carbonate of soda, thirty-two ounces of water. No. 2. Three ounces of sulphite of soda, thirty ounces of water; and for 10 by 8 plate, taking dry pyrogallic acid, six grains; No. 2, four ounces; and of No. 1, if the plate is likely to be fully exposed, half a drachm (instead of half an ounce, as usually recommended), and five drops of a ten per cent. solution of potassium bromide. If no development appears in five minutes he adds another half drachm of No. 1, which in nineteen cases out of twenty will cause it to progress "quietly and sedately." If, after five minutes more, it is not sufficiently dense, it might have another half drachm; but, above all things, "Don't hurry."

Some discussion arose on the question of using "dry pyro," several members affirming that properly made "sulpho-pyrogallol" would keep good any reasonable length of time, and was more convenient to use. It was pointed out that instances of pyro made up with sulphite of soda going black were due to alkalinity, and that if the solution were made acid it would keep.

Mr. Beer, however, thought that in any case the solution was uncertain, and that dry pyro went further in development than pyro in solution.

◆

Talk in the Studio.

North London Photographic Society.—The next meeting will take place on August 15, and will be a technical meeting: visitors invited. Excursions:—August 6, to Hampstead Heath, trains from Broad Street every half hour; August 13, to Wood Street, Walthamstow, trains from Liverpool Street every half hour.

Photographic Club.—The subject for discussion on August 10 will be "Varnishing and Varnishes." Saturday outing (if fine) at Hyde Park Corner, at 2 o'clock. Mr. Cobb will supply a vehicle.

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

G. H. H.—There will be no difficulty; we will send you a form to fill up.

Augustus T. Harvey.—The idea is one which may perhaps be acceptable to the existing societies. Write to the president of the Photographic Society of Great Britain, and explain the proposal.

H. George.—Probably it will be well to wait for two or three months.

M. A.—1. Thanks. 2. There is something unusual about it, and we are inclined to think it is due to the texture of the paper. Are all sheets in the bulk similar in character?

M. C.—All depends upon your qualifications, and probably the best thing to do will be to answer likely advertisements, and perhaps to advertise yourself.

C. Braxford.—1. Coat the metal with a tolerably thick layer of electro deposited silver; or you can get this done at one of the electro platers in Clerkenwell. 2. Such a course is likely to be unsatisfactory, as the thin edges are almost certain to wash up; if, however, you previously coat the glass with a thin layer of india-rubber, this will be less liable to happen. Obtain masticated rubber (say from Hancock, of the City Road), and dissolve two grains of it in one ounce of benzole. This should be flowed over the plate like collodion, and allowed to dry.

J. R. T.—1. You are not the only one who recognizes it as a mere trade puff; but we cannot insert your letter unless signed. 2. A matter of opinion; it is unnecessary that we should state our own.

Charles Burton.—1. Soak it in methylated spirit. 2. Equal parts of strong alcohol and water.

C. N.—A matter much to be regretted, but we see no advantage in doing what you suggest.

Cowherd.—Nonsense; write to the photographer to whom you refer.

An American.—We quite agree with you, but cannot insert your letter, as it is written over an assumed name.

John.—If your son has a reasonable amount of skill as the result of his four years' training, we think it would be far better to try and obtain a situation for him in some photographic establishment. Either answer advertisements, or advertise yourself; unless, indeed, you can, by more private endeavours, obtain something for him in a photographic establishment in your own town.

Lex.—Certainly it is a libel, and was written with the full knowledge of the fact. Nevertheless, it is true, and, what is more, its publication was in the public interest, and justifiable.

J. J. B.—Not less than six.

Photographs Registered.

George Biddle (Brighton)—Photo. entitled "The Huntsman's Funeral."

F. Thurston (Luton)—4 Photos. of Dr. Bartrum.

W. W. Winter (Derby)—Photo. entitled "Little Merrie May."

W. J. Byrne (Richmond)—2 Groups of Mr. and Mrs. Gladstone, the New Mahdi, and two Attendants, and others; 5 Photos. of W. E. Gladstone; 4 Photos. of Dr. Bradley; 8 Photos of Archbishop of Canterbury.

G. H. Martyn (Cheltenham)—2 Photo. Groups of Teachers at the Cheltenham Ladies' College.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

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A DIRECT TRANSFORMATION OF LIGHT INTO ELECTRIC ENERGY.

Instances of the indirect transformation are not new to the physical investigator, and a record of one of the first is to be found in the now classic work on the correlation of the physical forces written by W. K. Grove (now Justice Grove) when he was a young man. Special interest, however, attaches to some recent experiments by Kalischer, in which he describes a selenium cell which, when exposed to light, gave a permanent electric current.

Before quoting the abstract of Kalischer's paper, which appears in the *Journal of the Chemical Society*, we may say a few words in explanation of the nature of the physical organism known as a selenium cell. The selenium cell consists essentially of two conducting wires separated by selenium, and it has long been known that, when such an organism is placed in an electric circuit, exposure of the selenium to light means a diminution of resistance, or, in other words, that selenium conducts electricity better when exposed to light, and in some sense this increase of conductivity is proportionate to the intensity of the light. Indeed, several proposals have been made to practically use a photometer based on this action of light on selenium.

In practice, the selenium cell consists of two metal wires coiled side by side on a cylinder of glass, or other non-conductive material, care being taken that the two wires, though very close together, do not actually touch. A thin film of selenium is then melted over the whole, so that it runs into the interspaces between the wires, after which the cell is exposed to such a heat as shall bring the selenium into the best condition of sensitiveness.

Since the telephone has been a recognized instrument, Graham Bell has pointed out that when a selenium cell is exposed to rapidly-recurring impulses of light, corresponding impulses of electricity circulate through the connected wires of the selenium cell, and special interest attaches to the present observation of Kalischer, as it may be one element in a train of discoveries which may lead to such a complete transformation of light into electric energy as shall be of practical advantage to mankind.

The abstract of Kalischer's paper, as we find in the organ of the Chemical Society, is as follows :—

> About the same time that Bell discovered that an intermittent exposure to light generated a current in selenium which affected the telephone, the author met with a selenium cell which, under the action of light, produced a current which could be detected by a galvanometer. As it appeared that those who have paid special attention to the preparation of selenium cells have seldom met with cells which were so sensitive to light, an attempt was made, in the first place, to discover the proper mode of making such cells.
>
> The cell consisted of two parallel wires wound round a stem, with selenium melted between them. In order to ensure the sensitiveness of the cell to light, it was heated to 190-195°, kept at this temperature for half-an-hour, and then allowed to cool for an hour. If at first not successful, a repetition of the process produced the desired result.
>
> When such a cell is inserted in a galvanometer circuit and exposed to the action of light, there is a permanent deflection. It is found that the cells which are sensitive have a large specific resistance. To produce a current in general, a very intense source of light is necessary. The sensitiveness, and with it the specific resistance, were found in many cases to diminish with the time. The author believes that these facts are very well explained by the hypothesis advanced by Siemens that there is a metallic modification of selenium.
>
> Again, if a cell is placed in an arm of a Wheatstone's bridge and the balance obtained in the usual manner, on allowing light to fall for an instant on the cell there is a deflection, but the mirror does not return to its position of rest at once, and gradually creeps up to a fixed position. This is not due to the effect of heat, for it occurs even when the cell is shielded by an alum cell, or by a current of water circulating round it.
>
> It is proposed to call this phenomenon after-action, from the analogy it presents to other well-known physical facts. The analogy is traced out by showing that the after-action is dependent on the duration and the intensity of the illumination of the cell. It is also shown to be independent of the direction of the current.

◆

TECHNICAL EXCELLENCE.

There has been a sort of fashion amongst some writers on photography, to speak in a slighting, indeed almost contemptuous manner, of what is called technical excellence. It has been sometimes assumed that obtaining excellence in what they refer to as the mere mechanical details of photography, is so simple and easy, that it is not worth while to speak of the means by which such excellence may be ensured, but that there only remains to devote attention to what is called the art side of photography. It is because we think that such teaching is detrimental to the progress of photography, and indeed tending to that retrogression to which we have recently referred, that we propose to discuss the necessity for technical excellence in order to obtain not only that which shall be recognised as good from a purely photographic point of view, but the most complete artistic result also.

We do not propose here to enter upon the field of art criticism, which, by the way, was referred to by one of the recent comic papers as the last resource of the man who was plucked in his examinations, and turned out an utter failure at college. It may fairly be stated that art recognises two distinct characteristics—the imaginative, and the descriptive. In photography, the imaginative is a good deal replaced by the ability to recognise the beautiful, the grand, the sublime, or the picturesque. The painter who places upon the canvas a true portrayal of sky, sea, and foliage ; the poet whose writing brings to the mind's eye a vivid representation of the beauties of nature; the actor whose presentment of human passions impresses his audience with the actual presence of the feelings which he counterfeits, would all be admitted to be artists. On the other hand, one gifted in a high degree with the imaginative faculty, unless he possess the skill, natural or acquired, to set forth his ideas, must remain unfruitful and unrecognised.

If, then, accurate or truthful representation is recognised as art in the cases to which we have referred, it is hard to see why it should be ignored as art when photography is in question. Perhaps the reason for this different estimation is, that it is taken for granted that photography must yield a true representation, and that therefore no skill is required to ensure this result, and so where there is no skill there is no art.

The assumption that photography must be truthful, if it is justified when applied to a production technically excellent—*i. e.*, free from defects—is certainly not tenable with regard to a photograph in which defects and blemishes have been allowed to make their appearance. An example will make this evident. One very common defect in a photographic negative is the appearance of stains, patches, or messy places, due to irregularities in the development, or to other preventible causes. These defects show themselves in their native ugliness when they appear in the plain background of a portrait negative. The patchy lights and shades which they produce are not to be seen in the original background itself. Therefore the photograph is not a truthful representation. True, it may possibly be argued that a "broken" background is more "artistic" than one quite plain. Stains and messes, however, have no elective affinity confining them to the background, and, but for the details on the rest of the plate disguising them, they would probably be seen over the face, drapery, and other parts of the picture. Now, although these stains, owing to this disguise, may not show themselves as what they are in the detailed portions of the plate, it is certain that they must cause the particular places where they occur to come out lighter or darker than their proper value, in relation to the surrounding portions. Stains and patches have thus done their work in falsifying Nature, without our being able to detect the exact amount of increased light or shade which is due to this haphazard means, and we have to accept a defective presentment as a true representation. In landscape photography, with its varied forms of sky, foliage, and foreground, a great deal passes muster that would ensure the rejection of the photograph in plain portrait work; but this passing muster does not imply the goodness or the truthfulness of the representation of Nature, but only that we cannot so easily detect what is the true representation, and what is the accidental misrepresentation, due to imperfection in the photograph.

Photographic defects of other kinds might be adduced as causing untruthful and imperfectly artistic results, such as under-exposure, with its concomitant large heavy shadows wanting in those bits of quiet illumination that are so evident in nature; but enough has been said to show that the highest artistic excellence can only be looked for where what is called technical excellence is also present; whilst a high degree of the latter-mentioned quality will render most work interesting.

As to the assumption that technical excellence is so easy of attainment that it may be looked for as a matter of course, and does not require to be cultivated, a careful inspection of the photographs shown at any of our annual exhibitions should suffice to dissipate such an idea. Of the landscapes exhibited, it is not too much to say that one defect alone, halation, is shown in the greater part of the exhibits. Those who would excel artistically, as well as those who have less ambitious aims, should cultivate with unceasing care that technical excellence which is in reality displayed by only a very small proportion of photographers.

THEORETICAL CHEMISTRY IN ITS PRACTICAL BEARINGS ON PHOTOGRAPHY.

BY RALPH W. ROBINSON.

VI.—Fixation—Intensification—Reduction.

The film, after development, contains the image of metallic silver and the unaltered haloid, or haloids, and it is necessary to remove the latter. This is effected by acting upon them with such substances as will convert them into compounds soluble in water. There are two agents in general use for this purpose—potassium cyanide, more commonly employed with wet plates—and sodium thiosulphate (unscientifically called "hyposulphite" among photographers, thus comfounding it with the body Na_2SO_2, which is the true hyposulphite), used generally for dry plates.

We shall first consider the reactions involved when potassium cyanide is used. This salt, in solution, acts on the insoluble haloid, forming, by double decomposition, two soluble compounds—silver potassium cyanide, and potassium bromide, iodide, or chloride, as the case may be.

$$Ag\overline{H} + 2KCN = AgK(CN)_2 + K\overline{H}.$$

Should the action of the cyanide be prolonged after the haloid has been removed, the silver is attacked and dissolved.

It is chiefly on account of this action, and the dangerously poisonous nature of potassium cyanide, that sodium thiosulphate has taken its place in dry-plate photography, for the particles of silver, being finer in a dry plate than a wet one, are more easily attacked.

The only drawback to the use of sodium thiosulphate has instead of simply forming a soluble compound with silver haloid, an intermediate reaction takes place, whereby the compound $AgNa_2SO_3$, which is nearly insoluble, is formed, and so, if the action in the fixing bath is not allowed to continue long enough, a compound is left in the film which it is almost impossible to remove by washing, and remaining, decomposes in time, producing a yellow stain, which ruins the negatives. The further reaction in the fixing bath consists of the union of two molecules of the compound $AgNaS_2O_3$ with one molecule of sodium thiosulphate, producing the soluble salt

$$Ag_2Na_43(S_2O_3)$$

$$Na_2S_2O_2 + Ag\overline{H} = NaAgS_2O_3 + Na\overline{H}$$

$$2NaAgS_2O_3 + Na_2S_2O_3 = Ag_2Na_43(S_2O_3)$$

Should the negative be of correct density when fixed, nothing remains to be done from a chemical point of view but to thoroughly wash out the thiosulphate. It may, however, be too thin, or too dense, in which case intensification or reduction will be necessary.

Intensification is effected in so many different ways that a particular description of each would be quite out of place in this general outline of photographic chemistry.

Perhaps the method most generally used is immersion in a solution of mercuric chloride followed by weak solution of ammonia. The mercuric chloride converts the image, or at least as much of it as is changed at all, into mercurous chloride (a white body somewhat like silver chloride) and silver chloride.

$$2HgCl_2 + 2Ag = Hg_2Cl_2 + 2AgCl$$

Before treating the negative with ammonia it is washed quite free from mercuric chloride, which would form an insoluble compound, and hence stains in the presence of the alkali. The action of the ammonia is to convert the mercurous chloride, Hg_2Cl_2, into mercurous ammonium chloride, NH_2Hg_2Cl, of a dense brown and less actinic colour than the original image of metallic silver, while the silver chloride is dissolved. The equation given by some authorities is

$$Hg_2Cl_2 + 2NH_3 = NH_2Hg_2Cl + NH_4Cl$$

while others state that Hg_2O is also formed. Some photographers prefer to use sodium sulphite instead of ammonia for darkening the image after treatment with mercuric chloride, the advantage being that sodium sulphite, giving no precipitate with mercuric chloride, stains are not produced, and less washing is needed before the application of sodium sulphite. The mercurous chloride is converted into a dark-coloured body, but the nature of the reaction is at present not correctly ascertained.

Reduction is usually effected by converting part of the image into silver chloride, and removing this by immersion in "hypo." This is sometimes done by acting on the negative with ferric chloride, or for gelatine plates with a solution of bleaching powder. The former has the disadvantage of producing a negative of a bad colour, whilst the latter is apt to act on and soften the surface of the gelatine to such an extent that, unless the greatest care be taken, ruinous disintegration of the film may result. The reaction which takes place between the silver and ferric chloride is this :—

$$Fe_2Cl_6 + Ag_2 = 2FeCl_2 + 2AgCl$$

With bleaching powder it is—

$$2Ca(ClO)_2 + 2Ag_2 = 4AgCl + 2CaO + O_2$$

From the latter equation, it will be seen that in this method of reduction, besides the reduction of density by the actual removal of the surface of the film, silver chloride is formed, which must be removed if the negative is to be permanent. This seems to have been overlooked by several writers who have described the process. When first using the process myself, I neglected the precaution of fixing in "hypo" after reduction, and lost several negatives in consequence.

A reducer which, in my hands, works better than any other, is a mixture of sodium hyposulphite and alum filtered, which practically amounts to hydrogen hypochlorite (hypochlorous acid) and alum, as the following reaction takes place between the two bodies :—

$$Al_2K_2(SO_4)_4 + 6NaClO + 6H_2O =$$
$$Al_2(HO)_6 + 3Na_2SO_4 + K_2SO_4 + 6HClO$$

I have not found this method described previously, though it may have been ; but at anyrate it is not so generally known as it deserves to be, so I will give details. Mix by measure one part of saturated solution of alum with two parts commercial solution (it is only sold in solution) of sodium hypochlorite. Filter off from the white gelatinous precipitate ($Al_2(HO)_6$), and keep the filtrate in a tightly-stoppered bottle. It will gradually lose strength with keeping. At first one part of the solution should be mixed when required for use with two to four parts of water according to the amount of reduction required. After keeping, a smaller proportion of water should be added. The diluted solution is poured over the negative in a dish, and kept rocking until nearly sufficiently reduced. At this point it is taken out, well rinsed, and immersed in hypo. The resulting negative is in colour and general quality as good as if it had originally been developed to correct density. The action of hydrogen hypochlorite in silver is represented thus—

$$2Hg_2+4HClO=4HgCl+2H_2O+O_2$$

Another favourite method of reduction is to act on the image by immersion in solution of sodium thiosulphate to which a few drops of potassium ferricyanide solution have been added. I have not been able to find any record of the reaction.

PHOTO-SCULPTURE REDIVIVUS.

BY A CYNIC.

It is not very likely that photo-sculpture will have a second lease of life. Lazard's method may be better than Willéme's of five and twenty years ago, but busts—for I presume M. Lazard will not often attempt the whole figure —are not in favour with the public, and, I fancy, never will be. Rightly or wrongly, the impression is abroad that only a person who is really "somebody" should have a counterfeit presentment of himself in plaster or marble. Perhaps a point may be stretched in favour of a terra-cotta bust of diminutive size; but anything beyond this savours of unwarrantable vanity. Granting that a man may, if he likes, stick a marble bust of himself on a pedestal in his hall, or a terra-cotta miniature on his sideboard, it is quite certain that the workmanship and art must be of the very highest order, or photo-sculpture will be intolerable It is easier to go wrong with the chisel than with the brush, and we are afraid that photo-sculpture is more likely to err than photography.

Besides, as the majority of faces are commonplace, and as it is the commonplace people who generally want to be photographed, idealisation must come in if the bust is to be at all acceptable. As a French satirist, writing at the time when photo-sculpture was all the talk, observes :—"With photo-sculpture, which takes you from head to foot, right, left, face, back, cuts you mathematically in slices, which, reunited afterwards, compose your whole absolutely true—with this unpitying modelling, which shows the wrinkles in your brow, which puts in relief your protuberances, such as warts or any other defects you may happen to have, what will you become?" But who can be trusted to idealise? Only sculptors of the very first rank. And are they likely to associate themselves with a mechanical process? I should think it highly improbable.

The French technical papers, from one of which I have already quoted, quickly saw the absurdity of the thing. In *La Vie Parisienne* for 1863-4, there are several hits at photo-sculpture which are worth reproducing, as the subject has been revived. According to one illustration, the photo-sculptors will get as near as they can to Michael Angelo in appearance, and the artist has drawn a very comically majestic picture of a photographer whose hair is about six times as large as his head, and whose beard wholly conceals his figure. He has enormous lace ruffles at his wrist. In one hand he holds a mallet, in the other a chisel, and he is leaning gracefully on his camera. In the background is a specimen of his work—the bust of a lady in the latest style of bonnet.

In another picture we are told that the infliction of New Year's day—a social nuisance happily unknown in England —receives a new addition by the introduction of photo-sculpture. Instead of being able to satisfy etiquette by leaving your card, you must now hire a truck and a commissionaire, and load it (the truck, not the commissionaire) with statuettes of yourself to leave at the houses of your friends. "Ah! it is indeed like you, my poor Joseph," exclaims Madame Prudhame. "Really, you might die now, and I should be perfectly happy!" M. Prudhame, who has had his bust "taken," does not look over well pleased.

A very funny picture is that where the artist kindly suggests that for a very little extra expense the heads of the photo sculptured figures might be made to move up and down, in the style of the sixpenny pasteboard donkeys of the toy-shops. The specimen he gives must have made the ingenious M. Willéme, if he happened to see it, tear his hair. "I thank you a thousand times, my dear uncle," writes a young student of the Quartier Latin, "for having sent me your photo-sculpture. It has arrived just in time, for I had not a tobacco jar." The unison of the useful and the beautiful is indicated by the straight line across the uncle's shoulders, showing that the head takes off, and that his body can be filled with Bird'seye or Returns.

In a series of drawings also in *La Vie Parisienne* Marcelin caricatures the productions of the studio in the Avenue Wagram, where an attempt to establish photo-sculpture was made. "Poor sun," he exclaims, "it is not enough that they have made you paint, you must now be a sculptor." And then going to the other extreme, the artist draws a lamplighter entering the School for Fine Art, and being stopped by an attendant, who says he must not go in, because he is not suitably attired. "Oh," says the lamplighter, "I am the professor of sculpture by light." The centre picture of the series represents a person standing for his statue. He is mounted on a pedestal, and looks horribly frightened. He is surrounded by scores of lenses, which are drawn to represent eyes. "Why do they look at me like this?" he piteously exclaims, "and why has the man left me alone with them?"

The personal objections to photo-sculpture are pretty obvious. The shock to your wife's nerves when the servant informs her that she has knocked over "Master" with the dusting-brush, and broken his nose, must be extremely distressing. Nor is it nice to be told, when you come home, that you have been smashed during the day. The admiration of your friends must lead to "grubbiness," because no one can see a small bust without taking it up and turning it about to get the best view of your features. Being grubby, you must be washed, and this operation, as conducted in the domestic household, is, to say the least, humiliating. If you are a Newton or a Faraday, your life-size marble embodiment is taken up gently and dusted with care; but if you happen to be plain Jones or Robinson, your miniature terra-cotta reproduction is ruthlessly plunged into the footbath from which the baby has just been removed, and allowed to soak. This is a contingency, I make bold to say, to which the master of the household should not be exposed, and especially when his companions in misfortune are likely to be the china nic-nacs from the mantelpiece, and a few broken toys surreptitiously dropped in by one's youngest son.

And what is to become of the old busts and statuettes? Somebody once asked, what is the use of a new-born baby? I might parody the question, and ask, what is the use of an old bust? Sometimes such things are seen at auction sales among a "lot," under the head of "sundries" in the catalogue. It is too much to expect the "bust of the late Mr. John Smith" to figure in a lot by itself. When Smith had his features chiselled his friends admired the work; but now that he is dead, who cares for his bust? Even when you are a celebrity, the value of your bust becomes greatly lessened directly the breath is out of your body, and, in a few years' time, the thing becomes absolutely worthless. The Beaconsfield Club paid the aristocratic sculptor, Count Gleichen, £379 for a bust of Earl Beaconsfield. A few weeks ago this bust was sold for less than £40; and what is true of a great man is accentuated in the case of a small man. Supposing photo-sculpture to become a positive fact, and busts and statuettes to be as plentiful as photographs, it is pretty certain that some of these productions must in time find their way to the marine store dealer. They will glut the market, and swamp the Venuses, Apollos, and Mercuries of the Euston Road. There can be only one fate for photo-sculpture: Rosherville, North Woolwich, and other places of entertainment. But imagine Rosherville peopled by replicas of your uncles, your aunts, your sisters, and your cousins! The thought is intolerable; therefore preserve me from photo-sculpture.

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THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.

> "In the fair land o'erwatched by Ischia's mountains,
> Across the charméd bay
> Whose blue waves keep with Capri's silver fountains
> Perpetual holiday."—*J. G. Whittier.*

The beauty of her situation is the glory of Naples, and to appreciate this to the full, the traveller should approach from the sea. Entering from the North, you pass the Bay of Gaeta, then Cumæ, and as the steamer rounds the point, the extinct valcanic peak of Monte Epomeo in the Island of Ischia towers up on the right, the steep rocks and white houses of Procida come next on the left, and in quick succession the point of Misenum, overlooking the ruins of Baiæ, the old town of Pozzuoli backed up by the heights of Camaldoli, and the ancient craters of Monte Barbara and of Astroni, then the small island of Nisida with its snug crater harbour. Vesuvius looms up right ahead with columns of steam and vapour against an azure sky; the colour of the sea is an indescribable mixture of opalescent and golden tints, white lateen sails dotting its calm surface.

After rounding the point of Posilipo, the great city of Naples bursts upon the scene, in the glowing colours of the setting sun. The fortress of St. Elmo surmounts the heights; distant snow-clad peaks bound the horizon, and as the ship casts anchor, the sound of mandoline and of song comes wafted over the water, the eye roams round the Bay past Vesuvius, Pompeii, the mountains above Castlemare and Sorento, and on to the ever-lovely Isle of Capri, and you think that if perfection is to be found on earth, it is surely here.

The Neapolitans seem to be happy, light-hearted, frivolous, lazy rascals. The cabmen are of a strange nature; they will haggle vociferously about the fare, rising up in the seat to create a crowd which gathers at once, when the subject is freely and impartially discussed by all present; the matter once decided, your driver is a light-hearted, jolly fellow, who does his best to make you understand all about the objects of interest *en route.* If, as is often the case, he succeeds in doing you, and swears that he has no change (and he never has change), he goes off with a broad good-humoured smile that almost repays you for his robbery. He often drives at a fearful rate, bumping you over the stone-paved streets, and nearly wrenching the wheels off on the tram-lines. The small steeds sometimes have a hard life of it; we have often counted seventeen people on one light cart with one small nag emulating the engine of an express train. Two or three passengers sit on the shafts, and three more on the foot-board at the back of the vehicle.

The street scenes of Naples are lively in the extreme, and we spent a delightful morning of a cloudless day, taking instantaneous pictures along the Stradas, Santa Lucia, and Marinella. Many and varied were the subjects: teams of oxen, horses, and mules, knots of people basking in the sun, vendors of shells, oranges, fruit, and flowers, and the general life and scum that is seen about the docks of a great city. From the windows of the houses, mattresses hung for airing, and a perpetual washing day might be going on, judging by the numbers of clothes hanging about; and in spite of all this show, the people look dirty.

We photographed the well-known view from the heights just below the Castle of St. Elmo, where Vesuvius, the bay, and city, show to advantage, and where an umbrella pine balances the right hand of the picture.

We stayed for a week at the "Hotel Britaniques" on the Corso Vittorio Emanuele, a long fine promenade, high up, and commanding many good views of Naples.

The Pension is excellently kept and is moderate in charge, it being eight francs per day for everything; the landlady is Scotch; she and her Italian husband look well after their guests. We must pass over many of the sights of Naples, its churches, cloisters, and monuments, and its unique museum, abounding in sculpture and art, and containing the splendid collection of bronzes, jewellery, glass, mosaics, and frescoes from Pompeii and Herculaneum: additions are constantly being made to this portion as the excavation of Pompeii proceeds.

Our days were principally spent in excursionizing and photographing around Naples; the places of interest are numerous, Vesuvius being perhaps as attractive as any. At the beginning of the Christian era, Vesuvius was a dormant volcano; its slopes were richly cultivated except around the summit, where the loose volcanic cinders had not been covered by vegetation. The barren crest surrounded a deep crater whose rugged walls, tapestried with wild vines, enclosed the level space on which Spartacus with his 3,000 companions encamped. The wealthy Romans lived round about, enjoying the balmy air and warm springs. At last a series of earthquakes began, which lasted sixteen years; many houses were greatly damaged, including those in Pompeii. This city was rebuilding, when the earthquake period culminated in great eruptions of Vesuvius, wherein half the old crater walls were blown up, and Pompeii and other cities were buried in the triturated ashes from the volcano. Within the old crater another grew up, and the mountain assumed more or less the shape it now wears.

Monte Somma, the name given to the ancient crater ring of Vesuvius, encircles it half round, but it must be seen from the present crater before its precipitous sides and grand circular form can be appreciated. Monte Somma is a portion of an ancient volcano, whose eruptions took place under water, when the plain of Naples was buried at a great depth beneath the sea at a period long anterior to history. Its precipices are almost vertical, and are 1,370 feet in height. The cells of the lavas composing them differ from those in the lavas of the modern crater of Vesuvius, as the latter are always empty, while those in the lava dykes of Somma are filled with minerals derived from the sea water which percolated the rock in old times.

No stream of lava has ever reached Pompeii since it was first built, although the foundations of the town stand upon the old lava of Somma. Herculaneum is much nearer the crater of Vesuvius, and the ashes and streams of lava have accumulated there to the depth of from 70 to 112 feet.

As you pass through the thickly-populated district at the base of Vesuvius, you see many of the old black lava streams, including the one which covered Herculaneum. Many are being quarried for paving stones, and the cliffs of the mid-stream, which are hard basaltic lava, look almost as compact as black marble. The work of excavating at Herculaneum is so expensive and difficult that it will probably never be completed. At Pompeii, on the other hand, the work is easy; the products of the eruption which reached it, being confined to ashes and fine dust. This was converted into mud by the great rains brought on by the condensed steam from the mountain.

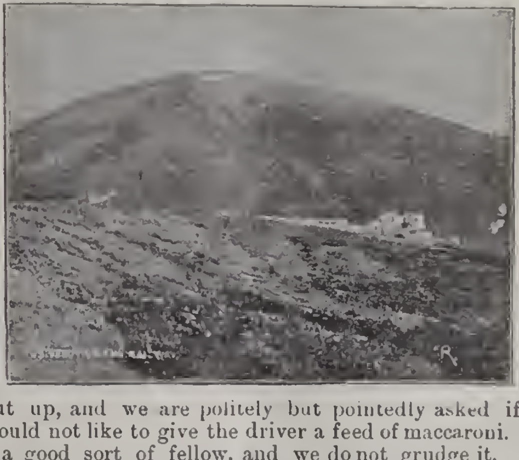
Roughly speaking, one-third of Pompeii has been excavated; the rest is still under semi-cultivated ground, where the Italian goat herd tends his flock. The grandest eruption of Vesuvius in the present century (except, perhaps, that of 1822) occurred in April, 1872. Vapours and rock were thrown to the height of 20,000 feet, nearly four miles. For more than twelve months previously the forces in the interior of the mountain had gradually increased in activity. At the time of the eruption the prodigious roaring was so great that the inhabitants of Naples five miles off fled from their houses and spent the nights in the streets. At three distinct points molten rivers of lava issued in quantities, which formed fiery floods flowing beyond the base of the mountain, and destroying two villages. Quantities of watery vapour were given off from the lava, which forced the congealing rock into great bubbles and blisters, and miniature volcanoes, varying in size from a beehive to a cottage, many remaining active for some time.

The steam from the crater spread out into a great horizontal cloud, around which were vivid displays of lightning, accompanied by thunder. The discharge of such quantities of steam caused long and continuous rains and floods, which resulted in mud streams more destructive than lava.

Braciani, who visited Vesuvius not long before the eruption of 1631, gives the following interesting description of the interior. The crater was five miles in circumference, and about 1,000 paces deep; its sides were covered with brushwood, and at the bottom there was a plain upon which cattle grazed. In the woody parts wild boars frequently harboured. In one part of the plain, covered with ashes, were three small pools, one filled with hot and bitter water, another salter than the sea, and a third hot and tasteless. But at length these forests and grassy plains were consumed, being suddenly blown into the air, and their ashes scattered to the winds. In December, 1631, seven streams of lava poured at once from the crater.

About 80,000 people live on the slopes of Vesuvius, and the fertility of the soil is owing to the decomposition of volcanic ejections.

The ascent of Vesuvius is a good day's work, but is now rendered easy by the railway, which has been laid up to the cone. This railway was expensive to make, and as it may at any time be demolished, or blown up, the company are, perhaps, wise in charging the seemingly exorbitant sum of 28 francs for the ascent. You leave Naples in a carriage and pair, for a two hours' drive through the suburbs. For another two hours the carriage conveys you up the mountain; a good road has been made, leading through the vineyards, and commanding lovely views; the road winds, and you cross the lava stream of 1872 several times. The lava is extremely hard, but with a hammer I managed to collect specimens. The lava stream of 1858 is also crossed. After reaching the observatory, the roadway belongs to the railway company, and pedestrians who are not hiring carriages, or going by the railway, must choose another path. The view of the cone from above the observatory, with the lava stream in the foreground, is striking. Arrived at the railway station the carriages put up, and we are politely but pointedly asked if we would not like to give the driver a feed of maccaroni. He is a good sort of fellow, and we do not grudge it. The railway being exceedingly steep, the carriages are built on the slant. One carriage, holding ten people, goes up at a time, and is drawn by wire rope. While looking over the lovely landscape your mind reverts to your past life and



its many misdeeds, and you think how very quick your descent from that mountain would be were the rope to break. I forgot to mention that the company do offer you insurance tickets as soon as you have paid your 28 francs. They are a considerate folk, these Italians. We have a capital guide allotted to us on stepping out of the train, and we are speedily at the edge of the crater.

The ground on which you stand is rough and slaggy, and full of cracks from which steam issues. The colours are brilliant in the extreme, the rocks or scoria being encrusted with bright yellow, pink, and red deposits. Clouds of white steam, dazzling in the sunlight, are constantly ejected with a dull roaring sound as of a gigantic mill at work. These clouds are often tinted with a lovely rose colour, the reflection of the glow below, in the crater. Scoria, and black cindery lava, is constantly thrown out, and the guides catch it on sticks while hot and pasty.

The day being still, we got our guide to conduct us all round the crater, thus obtaining grand glimpses of the old crater ring of Monte Somma, and of the surrounding plains, and the snow-capped Apennines. On the far side was the town and amphitheatre of Pompeii clearly discernible through field glasses, then more Apennines, Castelmare, Sorento, Capri, the lovely bay and immense city of Naples, and immediately below us the black lava streams winding down the mountain.

(*To be continued.*)

THE APPLICATIONS OF PHOTOGRAPHY IN ASTRONOMY.

BY DAVID GILL, LL.D., F.R.S.,*

Her Majesty's Astronomer at the Cape of Good Hope.

So remarkable has been the progress of the miscellaneous application of photography to astronomy within the past year, that some account of it is essential to bring the history of the subject up to date. For example, we have the recent work of Professor Pritchard, of Oxford.

He has applied photography during the past year to the most refined and difficult problem of practical astronomy, viz., the determination of the annual parallax (*i.e*, the distance) of the fixed stars. He has selected for experiment the interesting double star 61 Cygni. One of the original negatives of the series is now on the screen. This star, as is well known, was selected by Bessel, on account of its large proper motion, as the most suitable star for his first experiment. It was probable, because its large apparent motion among the stars was so great, its real distance from us would be less than that of stars of less apparent motion. Bessel'e observations with the Konigsburg heliometer proved this to be the case, and his discussion of these observations first convinced astronomers that the measurement of interstellar spaces was a problem not entirely beyond their reach.

Professor Pritchard has now photographed the star during a whole year, and within a few days he promises that we shall have the results of his measurement of the plates. It will be of great interest to compare his results with previous independent determinations of the parallax of the same star made by other astronomers with different means, but it will be still more interesting for the future of astronomy to compare the amount of accuracy which the photographic method affords, as compared with the older existing methods. From preliminary results published by Professor Pritchard we are led to expect a very high accuracy from the new process.

So far, however, as present experience goes, we shall not be able to apply this new method to the measurement of the parallax of very bright stars, because, when the plates have been exposed long enough to obtain pictures of the faint comparison stars, the discs of the brighter stars become too large and ill-defined for exact measurement. It may be that this obstacle will yet be overcome, but at present it has still to be faced.

On the question of the comparative merits of refractors and reflectors as the proper instruments for photographic use, very elaborate comparison has been instituted, and much discussion has been held.

From the simple facts, that the best work yet done has been done in stellar photography by refractors, and that they are in many ways more convenient and simple in use than reflecting telescopes, the Paris Congress unanimously adopted the refractor as the instrument to be adopted for the international star charts. But here is a very remarkable picture taken with the Oxford reflector, which shows star disc very sharp and very round over a very large field of view, viz., eighty minutes of radius.

In the photography of special objects, such as star clusters and nebulæ, much has been done.

Common's exquisite photograph of the great nebula of Orion you have seen before in this theatre, and for exqusite beauty of detail it has never been excelled. But of this we may be sure, that if Mr. Common is spared in health and strength to complete the great reflector of five feet aperture upon which he is now engaged, that photograph, beautiful as it is, will be far surpassed. Here is another photograph of the same object by Mr. Roberts. So short is the focus of his telescope, so sensitive are the plates he has employed, that the detail of the brighter parts has been completely burnt out, but a great deal of new-found detail is brought to light.

Here is another photograph of the same object by Professor Pickering taken with a four lens objective, of eight inches aperture and very short focus, and including a field of 5 degrees square. Exposure 82 min. This shows what can be done with such a combination.

In 1885 the Brothers Henry, photographing the Pleiades on November 16th, discovered a new nebula, near the bright star Maia in the group. Here on the screen is a copy of the original negative by which the discovery was made. You observe the nebula like a filmy projection from one of the stars.

After the nebula had been discovered by photography it was found to be visible in the great telescope of 30 inches aperture at Pulkowa. But to discover is one thing, to see after discovery is another.

Strangely enough, this new nebula was really photographed a fortnight before its discovery at Paris, by Professor Pickering at Cambridge in America. In exhibiting the photograph to the National Academy of Sciences five days before Henry's discovery, Professor Pickering pointed out the "wing" attached to the star, but there was only one plate shown; the impression was that the mark was due to a defect in the gelatine film.

Here, however, is another picture of the Pleiades taken at Cambridge with the same instrument, and an exposure of eighty-two minutes, which shows nebulosity about more than one star of the group.

And here is a copy of a negative by Mr. Roberts, of Liverpool, with an exposure of three hours. The star discs are of course large and ill defined; but the quantity of nebula, invisible to the eye in the largest telescopes, is quite surprising.

These photographs appear to prove conclusively that the nebula and the stars in this group are one system; the doctrine of chances renders it almost an impossibility to suppose that such a symmetrical arrangement of nebula matter with respect to the stars could exist by chance, if the stars were projected in front of a far distant background of nebulous matter.

Here is a photograph of the stars surrounding the celebrated variable star η Argus, taken at the Cape with the telescope of 9 inches aperture, generously presented to me for such work by Mr. James Nasmyth. The nebula surrounding this star is very faint compared with the Orion nebula, and it seems to be deficient in actinic rays, and besides, the telescope is intended for stellar photography by its long focal length, and not for nebulæ, which require a shorter proportional focus—*i.e.*, more intrinsically brilliant image.

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* Continued from page 494.

Still there is the nebula, and I believe this is the only existing photograph of the object. The exposure was 2¾ hours, and yet, although the original negative has been enlarged four diameters, the star discs remain well defined. The corresponding region of the sky is less than the moon's apparent diameter, and of the many thousands of stars visible on the photograph not a single one is visible to the naked eye. The star η Argus was in 1843 nearly the brightest star in the heavens—in fact, second only to Sirius. It is now between the 7th and 8th magnitude.

Here is a star-cluster in Argus. The star discs are not so sharply defined, but the original negative has been much magnified to bring out the star discs.

Here is a photograph, also taken at the Cape, of the wonderful star cluster ω Centauri. It is the finest globular cluster in the heavens, and I do not know that I have ever seen the separation of the central stars so distinctly with the eye as they are shown in this photograph. Perhaps, by photographing, we shall learn what motions occur in each cluster. This negative has been enlarged four diameters from the original.

Here is a photograph of the well known cluster in Hercules, taken by Mr. Roberts, of Liverpool, and a still more wonderful one by the Henrys, of Paris. They must be magnified more highly to give any idea of their quality.

When the objects are bright, such as bright double stars, or planets, or the moon, we can enlarge the image produced by the telescope by aid of a secondary magnifier.

Because of the greater size of the original pictures thus produced, the granulation of the photographic film interferes to a less extent with the detail of the picture. Of course, this advantage is purchased at the cost of a longer exposure, because the same amount of light is spread over a larger area of the sensitive plate, and consequently the same area of the film receives less intense light. With very bright objects, such as the sun, moon, and planets, this is of little consequence, and may be an advantage, as permitting more accurate regulation of the exposure.

Here is a picture of the sun photographed by M. Jaussen at Meudon, near Paris. The exposure is less than one-thousandth of a second of time. And here is an enlarged photograph of the same spot, showing an amount of detail which no artist could convey by hand and eye, nor could he emulate the absolute accuracy of the photograph. Here are some photographs of the planet Jupiter, taken at Paris, the original image being magnified 18 times. Here is another showing the remarkable red spot—you even have before your eyes evidence of the rotation of Jupiter on its axis by the change in the position of the spot during the same evening. This spot appeared in 1878, and measured about 30,000 miles in length by 7,000 miles in breadth. It became of a deep red colour in 1879, and for the three following years was a most striking feature in the planet. It almost faded entirely in 1883, but has again become nearly as bright as it was in 1882.

Miss Clerk tells the story most admirably and suggestively in the last edition of her "History of Astronomy," to which work I would refer those of my hearers in whom these beautiful photographs may excite a sufficient interest.

To enter fully into the matter would demand a lecture to itself—and the minute hand of that inexorable clock warns me that I must move on.

Here are some photographs of Saturn which illustrate the remarkable progress of celestial photography.

Here are some photographs of double stars; one of these, a photograph of γ Virginis, taken at Greenwich, is probably the finest photograph of a double star in existence. The star discs measure less than 1″ in diameter.

Last of all I come to the most recent revelations of the power of photography as an aid to astronomy. Dr. Henry Draper, in 1872, was the first to photograph the lines in the spectrum of a star, but his admirable investigations were interrupted by death in 1882. In 1886, his widow placed in the hands of Professor Pickering, of Harvard College Observatory, in America, not only an ample sum of money for the purpose of costly apparatus, but also made a liberal provision for carrying on the work of photographic spectroscopy as a memorial to her husband. So noble a gift, and the execution of so pious a purpose, could not have been placed in abler or more active hands.

Within the past few weeks we have received the first-fruits of Henry Draper Memorial Fund. When I began preparation of this lecture, I cabled to Professor Pickering for some glass copies of his original negatives. He kindly complied, and they arrived this morning. Time only permits me to show them rapidly, but those who remember Dr. Huggins's lectures on stellar spectra in this theatre, will recognise the enormous importance of such pictures as these. The ingenuity of the adopted methods, the extraordinary success attained, the promise of rich harvest, exceeding our highest expectations, which the results afford, are themes upon which one could dilate for hours.

Here we have the spectra of the distant stars whose actual discs we can never hope to see, registering in these rythmical lines the story of their constitution and temperature, with an accuracy and precision which not many years ago we should have been glad to obtain in the records of the spectrum of our own sun. And this is not all; not only have we such results for a few stars, but we are promised "that the complete work will include a catalogue of the spectra of all the stars of the 6th magnitude and brighter, a more extensive catalogue of spectra of stars brighter than the 8th magnitude, and a detailed study of the spectra of the bright stars." These are Professor Pickering's own words.

What Prof. Pickering promises, we know from long experience, that he will perform. We may also well say with him, that "a field of work and promise is open, and there seems to be an opportunity to erect to the name of Dr. Henry Draper a memorial such as heretofore no astronomer has received."

There is in England wealth enough and to spare. Many a rich man dies puzzled how to dispose of his money; and there is many a living man who would gladly give for such an object if he knew how to do so. There is field enough in astronomy, and there are men enough in England to do the work. Let us hope they will receive aid such as Professor Pickering has received; and having done so, they will give an equally good account of their stewardship.

The miscellaneous applications of photography to astronomy offer a field so full of promise, so certain of immediate reward to those who are possessed of the necessary originality and the means to carry out their ideas, that there is more hope of private enterprise in that direction than in the more routine work of star-charting.

But tempting as these fields are, brilliant and interesting as are the discoveries to be found in them, there is in the work instituted by the Paris Congress an element that cannot be overlooked and which compels attention—it is this: the question of the lapse of time. Every year which passes after that work has been carried out, increases its value and importance; every year that we neglect in doing it will be a reproach to the astronomers of the day. Into all the great problems which that work is destined to solve, the element of time enters—and time lost now in such work can never be recalled.

Of the Congress itself I would say a few last words. Its proceedings were characterised by an earnest spirit of work, and entire absence of international jealousy. Our reception by the French was cordial and hospitable in the highest degree, the decisions of the Congress were almost unanimous, and were marked by a moderation and judgment which must render them acceptable to the responsible authorities of the various Governments.

Lastly, I would add that the good will which pervaded the meetings, the general success of the Congress as a whole, were in no small degree due to the genial influence of the single-hearted, earnest-minded man who convened it—Admiral Mouchez.

Notes.

J. Mullins—of Hughes and Mullins, Ryde, Isle of Wight—sends five very successful portraits of Her Majesty which he has recently taken. The Queen wore on this occasion the same dress as at the State Jubilee celebration, and that she is pleased with the portraits is evident by the following extract from a letter sent from Osborne to the photographers:—"The Queen is delighted with the photos. you have taken of her, and all the Royal Family are very pleased with them. You will get a large order directly."

Like all published portraits of the Queen, these are ungenuine in the sense that that they have been manipulated by a retoucher; indeed, it is hard that the public cannot purchase a real photograph of the Queen, but have to be content with mixtures of photography and monochrome drawing.

In one respect, however, the photographs under note are far more truthful than most—inasmuch as the height of the Queen does not appear to have been exaggerated by artificial means, or if so, only very little. Consequently the first impression on looking at them is that the Queen is a much shorter woman than one might have gathered from other photographs. In this case the photographer would, perhaps, have given more satisfaction if he had cut two inches off the legs of the rather high table which is adjacent to the Queen. This would have toned down the shortness of her stature, and would not have been quite comparable with the more illegitimate means which have been adopted in other instances.

One hundred and seventy-three medals, of which twenty-one are gold medals, have been awarded to exhibitors at the Italian Photographic Exhibition recently held at Florence, and we made some efforts to count up the total of honourable mentions, but concluded to give up the task, as other more pressing business was on hand. If such liberality becomes general at exhibitions, it may become common for a photographer to boast of possessing several hundred medals, and several volumes of bound certificates of merit.

Of the medals, England takes six. Marion and Co., London, silver medal of first class, for apparatus; the Woodbury Co., silver medal, first class, for Woodburytypes; West and Son, Southsea, silver medal, first class, for instantaneous marine pictures; M. Auty, Tynemouth, silver medal, second class, instantaneous marine pictures; Morgan and Kidd, London, silver medal, second class, sensitive opal plates; C. Williams, Halifax, silver medal, first class, photographs.

The exhibition was, on the whole, a good one, in spite of the fact that some of the exhibits (and even some from England) were not considered good enough to receive an award.

The latest Jubilee offering to Her Majesty is a book illustrative of the history of the Ordnance Survey from its commencement, with drawings, photographs, and engravings, explanatory of the various works performed by that department. The presentation was made by Sir C. W. Wilson (Director-General), Lieut. White (Executive Officer), Lieut.-Col. Bolland (in charge of publication), W. J. R. P. Sharp (Civil Assistant), and Company Sergeant Major A. Algar, R.E. (sub charge of photographic department). Such a volnme ought to contain much that is valuable and interesting, and as it is highly improbable the Queen will ever read it, and certainly not make use of it, we would suggest that it be deposited either in the British Museum Library or the Patent Library, so that it can be referred to by those concerned in such matters.

If one wants news about photography there is nothing like going to the non-photographic press for it. *The Court and Society Review*, referring to the portraits of the ladies who presented the Women's Jubilee Offering to the Queen, which portraits were also presented at the same time, says sagely, "This would have been historically interesting years hence, but as they are photographs they will doubtless soon fade, for although many claim it, we have not acquired the art of rendering photographs permanent." What will the workers in carbon, in platinotype, and in enamel have to say to this astounding piece of intelligence?

Mounting photographs in albums is not an art which comes by nature. Very few people know, or take the trouble to know, how to make stout paste. The consequence is, that unmounted photographs in most households are spoilt, because no one can paste them in a scrap book decently. The Americans somehow have a knack of looking out for these human shortcomings, and of providing a remedy, and they have certainly done so by inventing a new form of album for unmounted photographs. The leaves of heavy cardboard are coated with some glutinous preparation, which is not apparent until moisture is applied. The photographs moistened with water are laid on the leaves of the book; a blotter removes the superfluous moisture, and the photographs stick "closer than a brother." At least, so says *The Paper and Printing Trades Journal.*

The American Photographic Association apparently recognize the framing difficulty, which is always the source of so much anxiety at Pall Mall, not only to executives, but also to the exhibitors. The Association has a very rough-and-ready method: all the exhibits competing for Association prizes must be without frames or glass; but pictures may be fastened to boards covered with cloth or paper, and a neat moulding, not exceeding one inch in width, may be put around the edge of the board to give it a finish. This is an innovation, the result of which will be looked forward to with some curiosity. The Secretary of the Association points out that by the abolition of frames those photographers who, from their moderate means, and from their residence at a distance, had not a fair chance at previous conventions of competing with those who went in for expensive and elaborate display of frames, will now come in on equal terms. This may be; but how about the general effect of the Exhibition? But perhaps the success of the American Exhibition does not depend upon the public, as does the Exhibition of the Photographic Society of Great Britain.

The latest photographic novelty in connection with fashion is to have wedding parties, including the clergyman and the clerk, and the pew-opener, photographed inside the church, by an adaptation of the magnesium light. At least, this is the proposition, for we have not yet heard of such a photograph being an accomplished fact. The proposer gravely says that a photograph of this kind "would be as good as a marriage certificate." No doubt. We should imagine that the plan would be found exceedingly useful in Scotland, where marriages can be solemnised simply with the assistance of witnesses. The only weak point is that a photograph of a gentleman putting a ring on the third finger of the right hand of a lady in the presence of a witness would not be conclusive evidence of a marriage, supposing the witness in question were dead or chose to commit perjury. To make the thing complete, the employment of a phonograph would be necessary. The reproduction of the exact words and voices of the parties, combined with the photograph of the scene, would be conclusive.

An ingenious inventor has applied photography to the ballot-box. A good sized marble, of the species called bull's eye, is placed in a tube at one end of a box, on which end are photographs and names of the candidates. The marble runs down the tubes, of which there are as many as there are candidates, strikes machinery which registers at the other end of the box, one for the candidate voted for, and then the marble comes out at the side, to be used again and again till the voting is done. The idea is not a bad one, but somewhat handicaps the unprepossessing candidate. The large proportion of voters do not care much which side they vote. A straw will turn them, and at the last moment they may vote for Jones because they like his face better than Smith's, although they intended to support Smith. This is a point worth consideration should the introduction of the photographic balloting-box at elections be contemplated.

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.*

Assistant Lecturer on Chemistry and Lecturer on Photography in the Yorkshire College, Leeds.

Processes without a Screen.—Various processes have recently been described for the preparation of orthochromatic plates which can be used without a yellow screen. They all depend upon the formation of silver derivatives of the dyes, these derivatives being particularly sensitive to yellow and orange rays.

The silver derivative of eosin, sometimes called *eosin silver*, and sometimes *silver eoside*, was described some years ago by Baeyer. The relation between it and the eosin is very much the same as the relation between potassium or sodium bromide and silver bromide—that is to say, the sodium or potassium which exists in combination in all the soluble eosins has been replaced by an equivalent quantity of silver. The corresponding derivatives of the other dyes of the same group have not been described in detail. The author has prepared them, and is at present engaged in investigating their properties.

The silver derivatives of the eosin group of dyes are precipitated when silver nitrate is added to aqueous solutions of the dyes. Eosin silver and phloxin silver are insoluble in water which contains silver nitrate or other salts, but dissolve somewhat readily in pure water. Erythrosin silver and rose Bengal silver, on the other hand, are practically insoluble in water. All the derivatives are readily soluble in ammonia, and they are generally applied in the form of an ammoniacal solution.

The formulæ which have been proposed may be divided into three groups:—(1) Those in which the plate is treated with a solution of silver fluoride, and then with an alkaline solution of the dye; (2) those in which the plate is treated with an ammoniacal solution of silver carbonate and the dye; and (3) those in which the silver derivative is prepared by precipitation, then dissolved in ammonia, and this solution applied to the plate. When silver fluoride is employed, the sensitiveness of this compound to rays of low refrangibility assists the action of the dye.

Obernetter's Formula.—Steep the plates in distilled water for one minute, and allow to drain, then steep for one minute in a dilute aqueous solution of silver fluoride; again drain, and finally cover three times in different directions with—

Erythrosin solution (1:1000) ...	25 parts
Azalin solution (conc.)	2 ,,
Ammonium carbonate solution (1:6)	50 ,,

Exposed plates are developed with the soda-pyro developer, and when development is half accomplished potassium bromide is added as a restrainer.

Vogel's Formula.—

French rose Bengal (1:1000) ...	10 parts
Eosin or erythrosin (1:1000) ...	25 ,,
Silver fluoride (1:1000)	3 ,,
Ammonia	1 part

First mix the two dye solutions, add the silver fluoride, and finally the ammonia. Then dilute with 50 to 100 parts of water according to the character of the result required, and the sensitiveness of the plates which are being so treated. The plates are bathed in the dilute solution, and allowed to dry in the dark. Exposed plates should be developed with alkaline pyrogallol. The prepared plates will not keep more than six days.

J. B. Wellington's Formulæ.—The plates are steeped for two minutes in the following solution:—

Silver nitrate	20 grains	(2 parts)
Ammonium carbonate ...	90 ,,	(9 ,,)
Distilled water	16 ounces	(760 ,,)
Erythrosin solution (2 : 100)	10 drachms	(60 ,,)

and are then rinsed with distilled water and dried in the dark. The sensitiveness of the plates is increased about three times, but they are very unstable, and will not keep for many days. In order to prevent fog during the development, the exposed plates are steeped for not more than thirty seconds in a solution prepared by mixing

Potassium bromide	120 grains
Ammonium bromide	½ ounce
Water	12 ounces

They are then washed under the tap, and at once developed with alkaline pyro or ferrous oxalate. If the colours of the object to be photographed contain a large proportion of blue, a yellow screen must be employed if the exposure is made by daylight; but this is not necessary if the exposure is made by gas or lamplight.* Gaslight or lamplight exposures always give the best results.

If desired, the silver erythrosin may be mixed with the melted emulsion, but this method requires great care, and plates prepared in this way should be used as soon as they are dry. The orthochromatic effect is very considerable, and the general sensitiveness of the emulsion is increased about ten times. The following proportions are recommended:—

Emulsion	10 ounces	(4,800 parts)
Silver nitrate	10 grains	(10 ,,)
Ammonium carbonate	45 ,,	(45 ,,)
Erythrosin solution (1:500)	5 drachms	(300 ,,)

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* Continued from page 454.

* It is difficult to see what advantage this method has over a simple bath of ammoniacal erythrosin.—C. H. B.

Before development, the exposed plates are treated with bromide solution in the manner described above.

Much better results are obtained with collodion emulsion, and a yellow screen is unnecessary even by daylight; but the keeping qualities of the plates are no better than in the case of gelatine. The following method is recommended. 10 grains (10 parts) of silver nitrate are dissolved with the aid of heat in 2 drachms (120 parts) of water, and 45 grains (45 parts) of ammonium carbonate added gradually in small portions until solution is complete. 8 ounces (3,840 parts) of methylated spirit is added gradually to the hot solution, and the liquid is then mixed with 5 drachms (300 parts) of a solution of erythrosin (1 : 500). The dried collodion emulsion plates are steeped in this liquid for two minutes, and then dried. Before development the plates are treated with the bromide solution as already described, and are developed by means of ferrous oxalate, 3 to 1, three grains of bromide being added to each ounce of developer. The exposure required by daylight is about four times as long as that for an ordinary gelatino-bromide plate, whilst by gaslight the exposure is about the same in both cases. The erythrosin silver is found to exert a peculiar toughening action on the collodion film.

*Mallman and Scolik's Formula.**—All the operations must be conducted in a deep ruby light. Fifty parts of erythrosin solution (1 : 1,000) is heated on a water bath, and gradually mixed with a ten per cent. solution of silver nitrate until no more precipitate forms, and the liquid is colourless. The precipitate is then filtered off, washed with cold distilled water until all excess of silver nitrate is removed, and dissolved in 2 to 4 parts of ammonia diluted with 20 parts of water, and the solution is afterwards mixed with 200 to 300 parts of water. The plates, which must be free from any trace of free alkaline bromide, are steeped in this liquid for one minute, and dried. Exposed plates are developed with soda-pyro or potash-pyro.

Development of Orthochromatic Plates.—The special precautions required, or methods to be adopted in each case, have been given with the formula. It should be borne in mind that orthochromatic plates are more liable to fog during development than ordinary plates, and therefore care must be taken to use a well-restrained developer in all cases. Pyrogallol with ammonia, potash, or soda, may be used with satisfactory results. If ferrous oxalate is employed it must be well restrained with bromide, but it is better to treat the plate at first with some developer which has already been used.

Since orthochromatic plates are highly sensitive to yellow and orange, their preparation, and all subsequent operations until they are fixed, must be conducted in a deep ruby light, care being taken to protect the plate as much as possible. Plates dyed with erythrosin may be developed in the light given by a candle screened with one thickness of good ruby glass, or, if proper care is taken, one thickness of Edwards' non-actinic paper (ruby), or any similar paper. It is possible to develop the plates in orange-yellow light, if very great care is taken to protect them during the first stages of development. Plates sensitive to orange-red or red are best developed in a subdued light obtained by filtering candle light through three or four thicknesses of pale brown tissue paper (*seide papier*). This is found to give the minimum amount of chemically-active rays consistent with the necessary amount of illumination. Plates sensitive to red must, of course, be kept in absolute darkness as far as possible, and all operations connected with their development, &c., conducted in a very weak light.

After the plates have been in the developer for some time, they become much less sensitive to yellow, orange, &c.

The presence of the dye, like the presence of free alkaline bromide in the emulsion, renders it much easier to obtain dense negatives. After fixing, the film generally retains a certain quantity of the dye, and is therefore coloured; but the colour does not materially interfere with the printing qualities of the negative. It can, however, in most cases, be almost completely removed by treating the plate with alcohol to which a few drops of ammonia have been added.

ON PHOTO-MICROGRAPHY AND ITS VALUE IN BIOLOGICAL RESEARCH.

BY EDGAR M. CROOKSHANK, M.B. (LOND.), F.R.M.S.*

(Lecturer on Bacteriology, King's College, London.)

Having introduced you to this apparatus, I will now demonstrate the method of manipulation. Supposing that we desire to take a photograph of tubercle bacilli in sputum with a $\frac{1}{25}$ oil immersion objective. The first point to claim attention is the arrangement of the light. Having lighted the gas at the hydrogen jet, the lime-cylinder should be revolved until heated equally all round. The oxygen is then carefully turned on until only a small spot of incandescence is produced. The central sliding-board is turned out, a low power screwed on to the microscope, and the image of the bright spot focussed and accurately centered. To protect the sight, an eye-piece provided with a smoked glass shade is used. The immersion objective is then substituted for the low power, and the oxygen turned on until the right admixture of gas is obtained to produce a brilliant illumination. It is as well at this stage to sit down to focus the selected object, and to spend some little time in searching for the best and most characteristic part of the specimen to be photographed. This being decided, the eyepiece is carefully withdrawn, and the central sliding-board rotated back into the median line. To make a light-tight connection between the camera and the microscope, the camera is pushed up until the velvet-lined tube, which occupies the position of the lens of an ordinary camera, is enclosed within a short wide tube which is adapted to the eyepiece end of the microscope tube.

The image will be projected upon the ground-glass screen of the camera on opening the camera-shutter. It is necessary, however, to obtain the exact focus, and to effect this the ground-glass screen is turned away, and the dark back, provided with a piece of plain glass, substituted. Here again time may be well spent in getting the sharpest image, with the aid of a focussing glass of proper focal length.

The greatest delicacy in manipulation is necessary, as in working with such high powers a turn too much of the fine adjustment, and the image will vanish. Having determined the best visual focus, the dark-back must be cautiously removed, to prevent any vibration, and the plain glass replaced by a sensitive plate.

On returning to the apparatus, the camera shutter is closed. Then the dark-back is gently slid into its place, and its slide withdrawn. A few moments are allowed to elapse, so that the least possible vibration which might be caused by inserting the dark-back has had time to cease, and all is ready for the exposure.

In the case of the object we have selected, three seconds will probably be the exposure required. This is done by opening and closing the camera shutter with one hand, while a watch can be held in the other. The slide of the dark back is then carefully closed, and the plate is ready to be carried off to the developing room.

I shall now demonstrate the advantages of photography with the help of some of the negatives before you. When the biological characters of micro-organisms are studied under low powers of the microscope, photographs are preferable, because there is an immense amount of detail, and they give a more faithful representation. At the same time, apart from this comparative value, we must not lose sight of the actual value of photography in placing within the reach of the student or investigator, who may not be a draughtsman, a most valuable means for illustrating all kinds of preparations.

With regard to individual micro-organisms, such as bacteria, the photograph is more satisfactory, in many cases, than a drawing, for there is the advantage of being absolutely certain that any particular structure, form, or shape which may be represented, is actually what exists, and not what may have been evolved by unconscious bias in the mind of the observer. Many illustrations might be given of this. Thus, Dr. Lewis, a most conscientious observer, published an account of organisms in the blood of rats in India, and illustrates his description with a wood engraving and with photo-micrographs. I have recently found very peculiar and interesting organisms in the blood of the common wild rats in this country, especially our London sewer rats; and I have been able to establish with certainty the identity of these organisms with those described by Lewis from his photographs, though certain statements in the description, especially as to their mode of progression, and the very diagrammatic woodcut, might have led me to an opposite conclusion.

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* *Jahrbuch f. Photographie*, 1887.

* Continued from page 487.

This subject suggests to me another example of the value of photography. I have recently identified the organisms just referred to with certain organisms which had been observed in association with, and regarded as characteristic of, a disease in horses, mules, and camels, known in India as "surra." Their discoverer noted appearances which he described as protuberances, while another observer failed to see any such appearances. Further, the latter regarded them as vibrios or spirilla, destitute of anything like a flagellum. I have very carefully investigated the structure of these minute organisms, and have concluded that they are not spirilla, but protozoa, with at one extremity a most distinct flagellum, at the opposite end a rigid filament, and, between the two, along the fusiform body, a delicate undulating longitudinal membrane. How far from convincing would these statements probably have been, had I not been able to substautiate my description, like a police notice, with an actual likeness. From the original negatives, and from the prints I shall hand round, I shall leave you to decide for yourself as to the existence of the flagellum and the other minute structural characters I have mentioned.

My mentioning the flagellum suggests to me another point to which I would like to draw your attention. Many bacteria, such as the hay bacilli and spirilla, are, as I have mentioned, provided with flagella. Now, some microscopists have been very sceptical as to their existence; others are in doubt as to whether they can be stained by the ordinary aniline dyes. I have already mentioned that Koch succeeded in staining them brown and photographing them. How immensely valuable, then, was Koch's photograph, for demonstrating the reality of the flagellum. And how valuable to me are the negatives which I now show you, for they have enabled me to demonstrate a double fact, first, that the flagella can be stained with the ordinary aniline dyes—in this case with ordinary gentian-violet; and, secondly, that they can be photographed in spite of their violet colour.

A micro-organism, even under the highest powers, appears as so minute an object, that to represent it in a drawing requires a very delicate touch, and it is only too easy to make a picture which gives an erroneous impression to those who have not seen the original. If, on the other hand, to represent the object more clearly, we draw an enlarged picture, we can only do so by representing what we think the object would be like if it could be amplified to the size represented. In such cases a photographic enlargement is certainly more valuable.

Such enlargements may be of value, not only as diagrams, but because they emphasize minute differences in form. I draw your attention, in illustration of this, to an enlargement on Eastman bromide paper, from a negative taken with a $^{1}_{2}$ hom. imm. The subject consists of tubercle bacilli in sputum, and the preparation had been stained with fuchsine and methylene blue. These bacilli are straight or curved beaded rods, and their discoverer, Koch, maintained that the unstained intervals between the beads were the spores of the bacillus. This view I regard as erroneous, and if you will carefully examine this enlargement, giving an amplification of 7,000 diams., you will notice that the intervals between the granules are not circular or oval and sharply defined, as they would be if they were spores, but they are only interspaces, varying in form according to the varying form of the beads.

In the case of tissue sections, however, especially when examined with a high power, a coloured drawing leaves but little to be desired. In such cases, it must be borne in mind that the difficulty arises from the fact that the mental image is the result of combining a series of pictures, produced by constantly focussing the section while under examination, and thus bringing fresh planes into view. Photography, on the other hand, will only produce a picture of the image in one plane. A remedy which suggests itself is to apply the system of composite photography; but I do not feel that this promises much when applied to photo-micrography, from the reason that superposing the images of different planes must necessarily result in want of correspondence, and hence a loss in the essential feature of a photo-micrograph, viz., definition.

In another direction I think we may look for improvement in photo-micrography, and that is in the employment of the objectives made of the new glass. I had hoped to have been able to lay before you the results of some experiments with the apochromatic objectives of Powell and Lealand, but great pressure of other work has prevented me from doing so, and I can only conclude by thanking you for the attention with which you have listened to this very incomplete sketch, while I trust that an examination of the prints, negatives, and transparencies which I have brought with me will lead you to consider that I have added my mite towards encouraging this valuable and interesting branch of the science of photography.

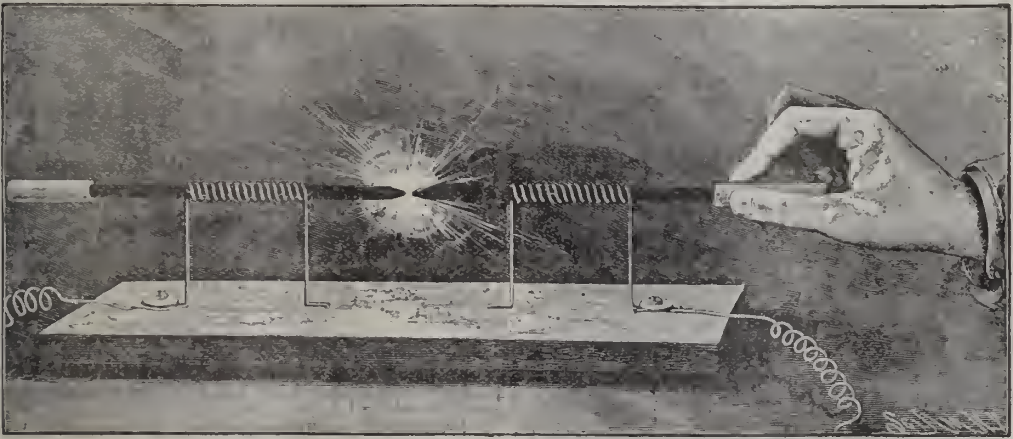

Fig. 1.—Simple Arc Lamp.

INEXPENSIVE ARC LAMP FOR LANTERN AND OTHER PURPOSES.

BY GEO. M. HOPKINS.

For most experimental uses, and for practical use in connection with the projecting lantern, the simple and inexpensive arc lamp shown in the above engraving serves a very good purpose. It requires an occasional adjustment of the carbons to maintain the arc; but this is a matter of little consequence if the lamp is used for a purpose requiring the constant presence of the operator in its vicinity. Should the arc be broken, it may be re-established instantly without careful adjustment of the carbon rods. As will be seen by reference to the engravings, the lamp requires little skill or time for its construction, and the materials of which it is made cost practically nothing.

The experimental lamp shown in Fig. 1 consists of two stout copper wires, say No. 12, each bent to form a helix of sufficient size to readily receive the carbon rod and permit of turning the rod for the purpose of feeding it forward to maintain the arc as its point is consumed. The straight ends of the wire extend in the same direction at right angles to the helix, and are offset and inserted in a board and bent down upon the under side of the board, as indicated by the dotted lines in Fig. 1. The two helices are arranged axially in line, so that the points of the carbon rods will centre accurately, and each helix is bowed at its centre to secure a spring contact with the sides of the rod.

The electrical connections are made by clamping a copper burr down upon one foot of each helix, and upon the end of one of the conductors.

The outer ends of the rods are inclosed in short pieces of rubber tube, to prevent an electrical contact of the fingers with the rods. When this lamp is used in connection with a small dynamo, or with a battery, no particular care is necessary in handling it, but it should be used with caution in a circuit conveying a very heavy current. By turning one or the other of the rods in the helix, it is moved forward or backward, according to the direction in which it is turned; the friction of the carbon in the helix giving the carbon the motion of a screw in a nut. When the arc is broken, it is unnecessary to screw the rod forward and then retract it, to re-establish the arc, as the wire will spring sufficiently to permit of pushing the rod forward to bring the points in contact, and the resilience of the wire will return the carbon to its normal position, thus establishing the arc.

The lamp is adapted to lantern use by grooving the edges of the board, and mounting the board between clamping pieces attached to a standard and provided with tongues fitted to the grooves of the board, a screw being inserted in the clamping pieces for drawing them into contact with the edges of the board, as shown in Fig. 2. A small concave reflector is attached to the centre of the board, to reflect the light which would otherwise be lost.

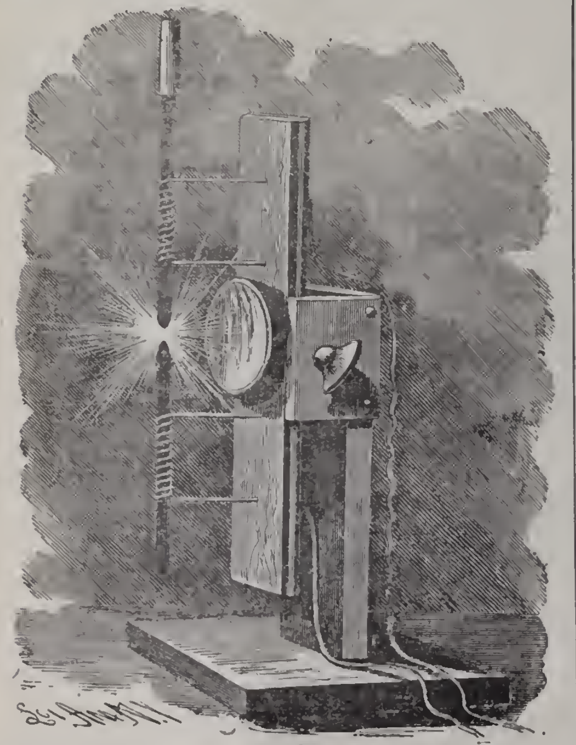

Fig. 2.

The clamping device permits of centering the reflector, and the arc is retained opposite the centre of the reflector by the occasional adjustment of the carbons.—*Scientific American.*

ON SYSTEMS OF NUMBERING PHOTOGRAPHIC LENSES AND DIAPHRAGMS.

BY O. SMITH.*

Many of my hearers will, I am afraid, consider that I have chosen a very dry and uninteresting subject; but when we remember that there are about half-a-dozen different systems in use amongst photographers, it is surely time to weigh one with another, and, retaining the best, dispense with the others.

In deciding whether one system of numbering stops and lenses is better than another, we must keep in view the object or purpose of these numbers. That object is the *easy and accurate determination and comparison of exposures*; and this is, therefore, the test by which we should compare any one system with another.

Before going further, I must, for the benefit of beginners, clear the way by illustrating the meaning of one or two of the technical terms I shall have to use in the course of the evening.

Let us suppose for one moment that a candle is placed at a distance of nine inches from a lens, and that, having focussed the image, we find the distance between the latter and the centre of the lens to be—as it might be—eighteen inches, then, if the candle were moved three inches further from the lens, we should find that the distance between the lens and the image, when the latter is in focus, would be reduced to twelve inches. If, again, the object we are photographing is still further off say eighteen inches—the distance between lens and focussed image will be only nine inches; and if, finally, we turn our camera towards some object a long way off, the distance referred to will be reduced to practically six inches.

These distances of (in the last case) a trifle over six inches, and in the previous cases of nine, twelve, and eighteen inches, I shall call *image foci*, so that when I speak of image focus you will remember that I refer to the distance between the optical centre of the lens—or, say, the place where the stops are inserted—and the focussed image formed by the lens.

You will have noticed, from the illustrations I have given, the general principle that the greater the distance of the object from the lens, the less will be the distance of the focussed image from the same point; but you will find that, gradually reducing the distance between ground glass and lens, you will at length come to a point beyond which it will be useless to move the ground glass screen, however far off the object may be, because, if you do move it beyond this point, you will only find a blurred image of the object. The distance between the centre of your lens and the ground-glass when the latter is at this point is the principal focus, better known to some of you as the equivalent focus of the lens.

You will notice that while the image focus is always changing, the principal focus—or, more correctly, principal focal length—is constant. It depends upon the construction of the lens, and will not vary unless the lens itself is altered.

I will now explain in a practical manner the two rules which assist us in judging the necessary exposure under different conditions of lens and stop.

The first is that the exposure required will vary in the same proportion as the square of the image focus. For example, suppose that the second is the correct exposure under certain conditions. Now, if all these conditions remain, except that the working focus is doubled, then the exposure required will be, not double the previous exposure, but 2^2, that is, four times.

I can best show the truth of this rule with the help of these models, which I have roughly prepared for the purpose. This model (a small model in the shape of a pyramid) represents the direction of rays of light passing through a small aperture, the back of the model representing the layer of light intercepted by an opaque screen.

If you move this screen (the base of the pyramid) twice as far from the point of light as it is at present, the rays, continuing to diverge, will cover a much larger surface; in fact, you will find, on measuring, that the surface now covered is just four times as large as that previously covered; you have just the same amount of light, but it is spread over an area four times as large. The light, therefore, at the surface of this screen (the base of the second model—the distance from apex to base in this case being twice that in the former case), is only one-fourth as concentrated—or, in other words, one-fourth as intense—as at the surface of the nearer screen. This being so, the exposure required in order to obtain the same result on a photographic plate at this (second) distance from the diaphragm will be four, that is, 2^2 times that required in the former case. Beginners might easily fall into the error of supposing that this rule depends upon the size of the plate, but you will observe that nothing has been said about the size of the plate, but only of the distance of the plate from the diaphragm.

In the same way if I remove the screen to three times its first distance, it will be seen that the light—spread as it is over nine times the first area—is only one-ninth as intense, and a plate will therefore require nine (that is, 3^2) times the first exposure.

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* A communication to the North London Photographic Society.

If, then, we call this distance one, and the exposure required one second, this (second) distance will be two, and the exposure required will be 2^2, that is, four seconds, and this distance will be three and the exposure 3^2, that is, nine seconds, or, in other words, the exposure required varies as the square of the image focus.

The second law relative to exposure is, that the exposure required varies inversely as the area of the diaphragm, or, what amounts to the same thing, the square of the diameter of the diaphragm. For example :—If under certain conditions the correct exposure is one second, and these conditions are altered only as regards the diaphragm by putting in one of one-fourth of the area of the previous one, then you must give four times as long an exposure. If, again, you substitute a diaphragm twice as large, that is, having twice the area of the first one, you must give half the exposure.

I might explain this by saying that as the aperture is twice as large, you will, of course, get twice as much light through it, and, consequently, will only need to give half the exposure. But as such an explanation would give a beginner no idea of the true reason, I will endeavour to explain it.

Rays of light are, as you may know from daily experience, reflected or emitted by materials in straight lines, and in all directions. Here is a sketch showing a side view of a diaphragm with the rays reflected from, say, a small stone. If your lens is turned in the direction of this stone, some of the rays will pass through the diaphragm and through the lens, and, being bent out of their course by the lens, will form on the groundglass a luminous point corresponding with the stone.

Now you will see at once that if I substitute for this diaphragm one having twice the area, twice as many rays—that is, these outside rays which were before prevented from passing to the ground glass by the metal disc—will now be able to pass through the diaphragm and lens to the ground glass, where, in consequence of the refracting influence of the lens, they form an image exactly overlapping the previous image. The image is now as bright as before, and will therefore require only half the exposure. Of course the same explanation applies to every point on the ground glass, and as the whole image is nothing but a number of luminous points, it applies to the whole image. If we substitute a diaphragm having three times the area of the first one, three times as many rays will be able to pass through to the ground glass, thus illuminating the image three times as much, and requiring, therefore, only one-third the exposure.

I have now only one other preliminary reference to make, and that is with regard to the standard numbers of the Photographic Society; these numbers are based upon a unit which has been found by a committee of the Photographic Society of Great Britain to be the best unit for practical purposes, and as uniformity in matters of this kind is of great value we ought to recognise these numbers and make more use of them than we have hitherto done. Without uniformity—that is, without some recognised standard—there can be no comparison of exposures between photographers.

I am this evening going to speak of five different systems. If any two of these should be found in practice equally good, but one recognizes the standard numbers and the other does not, then we must give the prefereuce to the former. The first of the five methods just mentioned is the *f* system.

I was out with this Club a few days ago, and, standing near two of our members in a wood, I overheard the following :—

"I say, Doctor, what exposure ought I to give for this?"

"Well," says the Doctor, "I'm going to give fifteen seconds for $\frac{f}{13}$, and I think that's about right."

After considering this reply for half a minute or so, the questioner asked how he could find out what exposure he ought to give for $\frac{f}{22}$—the aperture he was using; in reply to which the Doctor told him to divide twenty-two by thirteen, square the quotient, and multiply by fifteen, and the number thus found would be the required exposure in seconds.

I could not resist remarking to the Doctor that if we could not get more direct answers than that in our everyday work the demand for calculating machines would be on the increase. However, the Doctor was not to blame, for he did the best that could be done with the system. Yet nearly everyone expresses the rapidity of his lenses by means of this system—the beginner sometimes because his stops are numbered according to this system, and sometimes because he knows no other plan; the professional partly from habit and partly because, as he very seldom calculates his exposures, it does not matter to him how his stops are numbered. Besides the objection to the *f* system which I have illustrated, there are three or four others, but as they constitute the whole of the objections to the next system I shall speak of, I will not discuss them here.

(*To be continued.*)

Patent Intelligence.

Notice of Application for Amendment.

In the matter of Letters Patent granted to William James Lancaster, of Colmore Row, Birmingham, in the county of Warwick, for the invention of "A new or improved adjustable diaphragm for photographic cameras."—Dated the 19th day of March, 1886. No. 3879.

Notice of Option to Oppose.—Notice is hereby given that the said William James Lancaster has applied, under the provisions of the Patents, &c., Act, 1883, for leave to amend the Specification of the said Letters Patent, alleging as his reasons for so doing that "I find that the smaller details referred to in the claims and parts ruled out have been used for another purpose prior to the date of my application."

The amendments proposed are as follows (reference being had to the Queen's Printers' Copy of the Specification), viz.—

On page 3—Line 14 Inserting "in a photographic camera" before the word "employ."

Page 4.—Line 26. Striking out the word "male."

Page 5.—Line 25. Inserting after the word "that," "I am aware that diaphragms with adjustable apertures, such as those of what are termed Iris diaphragms, have been used before, and I do not claim them generally as of my invention, but"

Striking out the first, second, and third claims.

Line 47. Striking out the words "fourthly" and "fixed," and inserting before "also," "in a photographic camera substantially as and for the purpose herein described."

A copy of the Specification in which the proposed amendments are shown can be inspected at the Patent Office.

Any person or persons intending to oppose the said application for amendment must leave particulars in writing (on form G.), of his or their objections thereto, at the Patent Office, 25, Southampton Buildings, Chancery Lane, London, W.C., within one calendar month from the date hereof.

H. Reader Lack, Comptroller-General.

Dated this 6th day of August, 1887.

Official Abstract of Accepted Complete Specifications.

Lancaster. 12,571 of 1886. "Cameras (including lenses and lens fittings.)"—Detective camera: takes form of watch case, cigar case, &c.; telescopic tube bellows.

Edwards, 12,700 of 1886. "Sensitised plates, films, &c." Coating machine: improvements in scraper, cooler, and carrying bands, and in cleaning, colouring, and dusting plates.

Patents Granted in America.

367,176. Erastus B. Barker, New York, N.Y., assignor to E. and H. T. Anthony and Company, same place, for "Photographic paper roll-holder."—Filed Feb. 23, 1886. Serial No. 192,941. (No model.)

Claim.—1. In photographic paper roll-holders, the combination, with the box or case, of a removable frame for carrying both the paper supply and take up rollers of the holder, composed of the removable board or table E, over which the paper to be photographed passes, and of separate carriers K K for said rollers, made separately detachable from said removable table or board, substantially as specified.

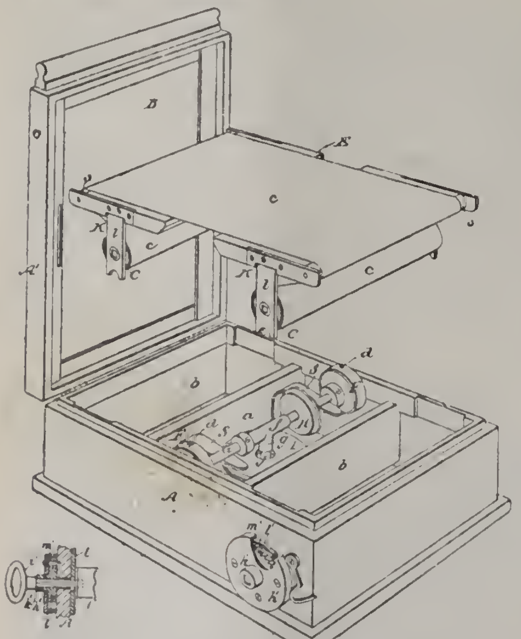
2. The combination, with the board or table E, of the separately detachable roller carriers K K and the separately detachable paper supply and take up rollers adapted to rotate within said carriers, essentially as described.

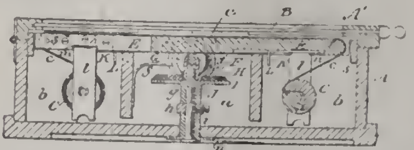
3. In a roll-holder, the combination, with the board or table E, of the detachable carriers K, for the paper supply and take up rollers, composed in part of an elastic strip *k*, capable of torsion or twist, and the locking slides or catches L, adapted to secure said carriers to said board, substantially as specified.

4. The combination, with the board or table E, and the separately detachable carriers K, for the paper supply and take-up rollers, of the elastic slides or catches L, arranged to engage

with said board, and to hold said carriers thereto, but left free of the board at their ends which support or hold the carriers to their places, substantially as and for the purpose herein set forth.

5. In photographic paper holders, the combination, with the box or case and a movable or loose frame carrying both the paper supply and take up rollers, an indicator adapted to be actuated by the paper when in motion, and mechanism for operating said indicator, of spring-supports adapted to throw said mechanism in and out of gear with the indicator, essentially as and for the purposes specified.





6. The combination, with the box or case A, of the marking-wheels F F, the shaft G, capable of forward and backward movement within said case, the wheels H I, and the indicator-shaft J, substantially as specified.

7. The combination, with the box or case and its lid, of the marking-wheels F F, a spring or springs for pressing the same outward, an indicator applied to the box or case, and gear establishing and breaking connection between said wheels and the indicator on applying or removing pressure to or from the marking-wheels by the opening and closing of the lid of the case, essentially as described.

8. The paper-carrying rollers C, having their bodies composed of a longitudinal main section a', and an opening and closing longitudinal section b', of broken circular continuity with the exterior of the main section, in combination with the end pivots d' of the opening and closing section arranged in concentric relation with the body of the roller, substantially as and for the purpose specified.

9. The combination, with the main section a' of either roller C, the opening and closing section b' of broken circular continuity with the exterior of the main section, and the pivots d' of the opening and closing section arranged in concentric relation with the body of the roller, of a spring applied to said sections and openings close the pivoted section b', essentially as herein set forth.

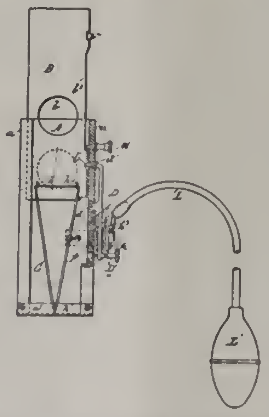
10. The combination of the end plates f, having sockets e', with the pivots d', the opening and closing roller-section b', carrying said pivots in concentric relation with the body of the roller, and the main roller-section a', substantially as specified.

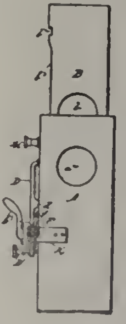
11. In a roll-holder, the paper-carrying rollers C, having their bodies composed of longitudinal sections a' b', adapted to open and close in relation with each other, in combination with a spring arranged to close the one body-section against the other for retention of the paper in between them, essentially as described.

12. The combination, with the opening and closing body-sections a' b', of the paper-carrying roller or rollers, of the spring s', the screws or pivots d', and the socketed end plates f', substantially as specified.

13. In a roll-holder, a registering-wheel placed intermediate the rollers of said holder, and pressed by means of a spring against the sensitive film, in combination with an indicating device.

366,947. Joseph J. Fox, Bryn Mawr, assignor to James W. Queen and Co., Philadelphia, Pa., for "Camera-shutter."—Filed August 12, 1886. Serial No. 210,729. (No model.)





Claim.—1. In a camera-shutter, the combination, with a frame A, of a drop or slide B, and a lever D, having at one end a detent or pin d', which holds the slide in an elevated position, and having at its other end a screw which may be adjusted to either arrest or to clear said slide in its descent or movement, thereby enabling the shutter to be used for time or instantaneous exposures, either or both, substantially as shown and described.

2. The combination, with a camera, of a frame A, a slide or drop B, having recesses near each end, a lever D, having pins on each end, a diaphragm h^2, pipe h^3, tube L, and bulb L', all constructed and arranged substantially as shown and described.

3. In a camera-shutter, the combination, with a frame A, and a slide or drop B, of a detent M, adapted to engage the said slide or drop after its descent or movement and prevent recoil, substantially as shown and described.

4. In a camera-shutter, the combination, with a frame A, and slide or drop B, of a detent for preventing recoil of said slide, said detent being adjustable to move and hold it out of contact with the slide, substantially as shown and described.

Correspondence.

H. P. ROBINSON AND AMERICAN APPARATUS.

Sir,—I desire to thank Mr. H. P. Robinson for the information unasked, that the Scovill Manufacturing Company, New York, are the manufacturers of the "Wale" lens; but a greater favour would have been conferred had he stated whether a lens of 13 inch focus, such as he recommends to be essential, can really be obtained.

W. M. Ashman.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on the 4th inst., J. B. B. Wellington in the chair.

The Hon. Secretary read a communication from M. Stebbing in reference to the circular issued by the Douai Photographic Society, which suggested that a congress of photographers should take place in Paris during the exhibition of 1889. The matter would come under the consideration of those entrusted with the management of Class XII, and when details were decided upon, another communication would be sent by M. Stebbing to the Society.

On the proposition of A. L. Henderson, it was decided to forward a congratulatory telegram to the Photographers' Convention of America, which takes place this week at Chicago.

The Chairman drew attention to a photogravure illustration in a recent number of *Anthony's Bulletin* (New York), and invited W. T. Wilkinson to make a few remarks upon processes of this kind. That gentleman could not say exactly how the print in question had been prepared, but it was certainly based upon the method of Fox Talbot. He had recently devised a plan of working with bitumen, which answered admirably. He took a thin solution of bitumen in turps, and distributed an even spray over the surface of a clean copper-plate by means of the American air-brush sold for retouching and finishing photographs in monochrome. With a little practice Mr. Wilkinson said this arrangement would give a satisfactory coating. Upon this a carbon negative from a transparency was squeegeed and developed, after which the carbon image was covered with a one-half saturated solution of iron perchloride, and the etching action continued until the copper plate became slightly darkened beneath the most dense parts of the gelatine. The carbon image was then cleaned off with hot water, and a well-etched copper plate in half-tone would be the result. The process, moreover, need not occupy longer than a few minutes.

A. L. Henderson had printed with bitumen more than thirty years ago, and the half-tones were perfect. He hoped Mr. Wilkinson would send specimens of his process to the Society. He then stated that a complete cure for the frilling of gelatine negatives during hot weather would be found in rubbing the plates previous to coating with a one per cent. solution of chrome alum.

The Chairman had, at Mr. Henderson's suggestion, tried the plan now recommended. He, however, rinsed his plates again in clean water, and dried before coating. The films would not frill in hot water.

W. H. Harrison stated that Baron Bunsen found, from experiment, that thin films attached to polished surfaces like glass possessed a tenacity equal to several hundred pounds weight.

A few small prints, produced by means of the Acme camera, were shown by L. Medland.

A. L. Henderson said that an emulsion of his four months ago registered about 22° on the sensitometer. The plates now gave 28°, according to Mr. Cowan's test, the highest number (25°) being fully out.

A. Cowan thought the plates were packed before becoming thoroughly dry.

In reply to a question, A. L. Henderson said that he had added ammonia carbonate to the finished emulsion, and the plates might not have been quite dry when packed.

North London Photographic Society.

The usual bi-montly meeting took place on August 2 at Myddelton Hall, Islington, J. Traill Taylor, in the chair.

The President, referring to the proceedings of the last meeting, showed two negatives taken at the Alexandra Palace with a detective camera, which was fitted with the American pattern dark slide, where the shutter is entirely removed during the exposure. He had allowed the full sunlight to fall upon the dark slide during exposure, but still there was not the slightest trace of fog in the negative. He did not believe that there was any necessity to attach so much importance to the finders usually fitted to detective cameras. He had made a great many exposures while holding the camera in his hand, and could point it so accurately as to be able always to place any given object in the centre of the plate at will, and he found no difficulty in keeping the camera perfectly level.

S. G. B. Wollaston exhibited a diaphragmatic shutter invented by C. Wollaston, and also several prints from negatives taken with it: the principal advantages claimed for this shutter being that it would give an exceedingly rapid exposure, which had been ascertained by experiment to be less than the one-hundredth part of a second; that the shutter, being placed between the lenses and opening and closing at the centre, the utmost evenness of illumination was obtained; that the shutter did not in the least degree cause the camera to shake; and that in using this shutter there was not nearly so much falling off of definition at the margins of the negative as was the case with a great number of shutters sold in the market.

Octavius Smith then read a paper on "Systems of Numbering Photographic Diaphragms and Lenses" (see page 508), illustrating the laws of light connected with the subject by means of diagrams on the blackboard, and by models.

F. W. Hart said that when he commenced photography there was no such thing as being troubled about exposure tables and numbers of diaphragms and lenses. It was only within the last few years that photographers had commenced to worry themselves about these matters. In the old days a photographer looked at the ground-glass screen of his camera for a short time, and, after a little reflection, said, "Well, that will take fifteen seconds," or a minute, as the case might be, and it was seldom that he found himself wrong in his calculation. *Now* it was customary to work out the exposure necessary with the aid of four or five very complicated tables. He advised everyone to go back to the old method and trust to experience. At first they might spoil a few plates, but, after a time, he was sure they would get on much better than with the tables.

L. Medland had tried working with the aid of exposure tables, but could not succeed with them. He remembered once being out with a friend who had a strong belief in their usefulness, and he got him to calculate an exposure from his tables, and found the resulting negative so much over-exposed as to be almost useless even after intensification.

F. W. Cox said he knew Mr. Medland's friend, and thought it only fair to say that he was a very successful photographer, and produced excellent work wich the aid of exposure tables.

George Smith thought that the lecturer had complicated his paper by speaking of the principal focus of lens, and also that he had been too exact in working out the various formulæ in the manner he had done. He would like to correct Mr. Smith, and denied that there was the amount of error which had been stated in the formula which he gave in connection with the area system. He did not say that it was mathematically correct, but it was quite near enough for all practical purposes. In the area system he had adopted $\frac{f}{16}$ as the unit, as it was the largest aperture used in ordinary landscape work, and he could not see that it would be at all advantageous to adopt $\frac{f}{4}$ as the unit.

A. Mackie could not help noticing how extremely accurate Mr. Smith had endeavoured to be, right through his paper. He did not think the subject so important as some people attempted to make it, for after the tables had been most carefully compiled there were such matters as the rapidity of the plate and the chemical quality of the light to be guessed at; and, taking all things into consideration, it was, in his opinion, far easier to make a correct exposure by one's experience than by the use of exposure tables.

L. Tavener considered that there was very great latitude in exposure, provided the developer was regulated accordingly.

George Smith said, that as the exposure depended so much upon the distance of the object from the camera, he considered Howard Farmer's tables were most useful.

The President said that many photographers, after having made a correct estimate of the necessary exposure, were unable to calculate the time in cases of short exposures, and recommended a system of mental calculation instead of using a watch.

The further discussion of the paper was adjourned.

Edinburgh Photographic Society.

The Society's annual excursion took place on Thursday, August 4th, to Dollar Glen. The attendance was of a rather limited character this year, but the trip was highly enjoyed by all who were present. The party left early by rail, crossed the Forth at Alloa, and arrived at Dollar about 9 a.m.

Where to go with the camera is frequently discussed in the journals, and is a question which has much interest for those who take it a-field. If Dollar Glen is within photographic reach at any time it should be visited. It has some features which render it unique. Some terrible convulsion of nature must have rent and split its rocks and precipices in the remote past. Every few steps disclose new aspects—or, in photographic phrase, there is a splendid negative in every turn one takes. The winding path, now shaded, now open, leading at times over foot bridges, through weird rock passes, with water running far below, hidden in dark chasms, then emerging into the bright sunshine again. By all means let the camera be taken to Dollar Glen. The way becomes more steep as the top of the ravine is approached, where Castle Campbell stands. It is a considerable ruin, crowning a rock, and from its lofty battlements a most extensive and beautiful view is to be had.

Many plates were exposed on the way up, and among others a group was taken of the whole party, the services of a stranger being obtained to uncap the lens. Several views of the ruin itself were taken, including a couple of 10 by 12 exposures. About fifty plates were used in all, and the subjects being so variously lighted, the exposures were from drop shutter to three minutes. A well appointed peripetetic larder in no small degree assisted artistic, as well as "grateful and comforting," appreciation of the beauties of nature.

Talk in the Studio.

Argentous Compounds. By E. Drechsel (*Ber.*, 20, 1455).—When an ammoniacal silver solution is kept for some time in contact with peptone, it gradually acquires a deep port wine colour like that of so-called argentous oxide; when a current of ozonised air is passed through the solution, it becomes colourless without precipitation. This reaction is most readily explained on the assumption that the red solution contains argentous oxide. On the other hand, it is conceivable that silver peroxide was formed from the silver, and that this reacted with the ammonia present, with formation of silver oxide and evolution of nitrogen. By O. v. d. Pfordten (*Ber.*, 20, 1458—1474; compare Abstr., 1885, 955).—20 c.c. of a 12·5 per cent. solution of sodium tartrate, and a solution of 2 grams of silver nitrate, are mixed with 1½ litres of water; 2 c.c. of a 4 per cent. solution of sodium hydroxide is then added, the whole being stirred violently. After five hours, the supernatant liquid is poured off from the fine black precipitate. The solution is treated in like manner three times with the same result. The united products of several experiments are washed by decantation with a dilute solution of sodium sulphate; water alone cannot be used. The purified black compound is probably argentous tartrate. When a solution of 10 grains of silver nitrate in 20 c.c. of water, in presence of sufficient ammonia to give a clear solution, is gradually treated with 4 c.c. of a concentrated solution of phosphorous acid, a black precipitate is formed. The solution is filtered, and again treated in the same way with phosphorous acid. The black compound is washed with water until the filtrate comes through turbid, and then with ammonia. *Argentous oxide*, Ag_4O, is prepared by treating either of the above black salts with alkali, and washing with water containing alkali. It forms a deep black, amorphous substance; it must be kept under dilute alkali. It cannot be dried without decomposition; water decomposes it. When treated with a mixture of potassium permanganate and sulphuric acid, it dissolves as an argentic salt. By means of this reaction, the formula of the compound was established; the wet substance was added to a mixture of titrated permanganate solution and dilute sulphuric acid, and the permanganate titrated back with a solution of ferrous ammonium sulphate. The silver was determined in the same solution, and the relative amounts of silver and of oxygen used up determined. Argentous oxide is insoluble in ammonia and in acetic acid. It is converted by hydrochloric acid into a mixture of silver and silver chloride. Phosphorous and sulphurous acids do not dissolve it. Hydrogen peroxide has no action on it in the cold; when warmed, metallic silver is formed. Alcohol reduces it slowly. Mercury has no action on it. It is somewhat soluble in water; the solution is greenish, reacts neutral, and is not precipitated by soda solution or by hydrochloric acid. Sulphuric acid decomposes it with formation of silver and evolution of oxygen; the same result is produced, but more slowly, by hydrocyanic acid, by sodium chloride, and other indifferent solutions. *Argentous sulphide*. Ag_4S, is prepared from the black argentous salts by the action of sodium hydrogen sulphide; it is a black amorphous compound; when dried it is grey. Water decomposes it after a short time. It is insoluble in ammonia, dissolves sparingly in warm dilute nitric acid, decomposes with separation of sulphur when treated with strong nitric and sulphuric acids. It dissolves in hydrochloric acid, and is precipitated unchanged by water; it is also soluble in potassium cyanide solution (dilute sulphuric acid gives a black precipitate). Potassium permanganate and sulphuric acid dissolve it with separation of silver. When dried, or when kept under pure water, it changes into a mixture of silver (2 mols.) and silver sulphide (1 mol.) (Compare also Trans., 1887, 416.)—N. H. M.

Adhesive Gums for Labels, etc.—The following mixture is stated by M. Eliel to form a strongly adhesive gum, which will really make paper or parchment-paper stick to any surfaces on which it may be applied, such as wood, glass, stone, or metal of any kind:—Gum acacia, 120 grammes or parts; gum tragacanth, 30 grammes or parts; glycerine, 120 cubic centimetres or parts; thymol, 2·5 grammes or parts; water, q.s. to make one litre or 1,000 parts. Soak the gums separately in a little water, and when the tragacanth is fully swelled, beat it up to the consistence of a thick homogeneous mucilage, and mix this with that of the gum acacia, and pass the whole through a piece of fine linen or "tammy." Add to this the glycerine, in which the thymol has previously been shaken up, and lastly make the whole up to a thousand parts, or one litre by measure, and store in suitable well-corked bottles ready for use. Burgoyne's *Monthly Magazine*, commenting on the above, says:—For the 2½ grammes of thymol we ourselves prefer to substitute 2 grammes of eucalyptol, or about 3¼ grammes or parts of Australian eucalyptus oil. With this gum labels or circulars can be made to adhere firmly to tins or metallic drums, &c., and if written or printed with the boracic "label ink," and afterwards washed over with "water-varnish," such labels, &c., will be very durable, and will remain unaffected by ordinary chemical solutions or dilute acids.

Photographic Club.—The subject for discussion on August 17 will be "Organizing Photographic Outings." Saturday outing at Pinner, trains every half hour.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Chas. Reeves.—A description appeared on page 288 of our issue for May 6th last.

W. and Co.—1. Any article you may send for review will be dealt with in the ordinary course, and we assume that when an article is so sent we are perfectly at liberty to say evil or good of it, as may seem right to us. 2. We do not give advertisements inside the paper on any terms; neither can we advise you in this matter. Consult an advertising agent.

E. Kindersley.—Probably the size of the paper contains alum. Try stout Saxe paper, which you can obtain from any large dealer in photographic requisites.

Amateur.—If you paint the edges and back with ordinary Brunswick Black it will afford ample protection against the acid, provided that the metal covered is quite dry, slightly warm, and free from gummy matter when painted. If the film of Brunswick Black becomes brittle and scales off, use Brunswick Black with which a little melted india-rubber (unvulcanised) has been mixed. The rubber must be heated until thoroughly liquefied, after which it will not solidify on cooling. Always write if you require information.

M. A.—You will find the matter referred to in another part of the present number.

C. A. P.—We will write to you privately.

A. H.—The best way will be to make a fresh bath, and to reduce the silver from the old one.

W. G.—1. It is made by Newton and Co., of London. 2. It is a rise-and-fall shutter, with no very characteristic features.

S. Becket.—The whole cost is about one-and sixpence, and you can obtain the blank form by sending twopence to Piper and Carter, 5, Furnival Street, E.C.

Carl O. Lyon.—The print has not yet come to hand.

J. M.—1. Yes, if the tissue is made up with a vitrifiable pigment. 2. There is no such method. Taking the average of results, all such methods give pictures inferior to a good silver print.

J. W.—Generally speaking, the abstracts have been in hand a week or ten days before they are published in the News, and the English Patent Library gets the American Official Patent Journal at the same time we get it. All American specifications can be obtained by remitting the price (which is, we believe, a uniform charge) to the Controller. We will post you the next number of the Official Journal that we receive, and this will give full information. Send us the number of your house if this is an essential part of your address.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1511.—August 19, 1887.

PATENT OFFICE LIBRARY

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THE NEW PARLIAMENTARY BILL AGAINST FRAUDULENT MARKING AND TRADING.

A bill now before Parliament, and which will, in all probability, become law before long, is of especial interest to photographers and photographic supply houses, as it will render penal certain practices which are now common among the latter.

The purpose of the measure is to secure more honesty and truthfulness as regards the descriptions by traders of the goods they supply, and the fundamental principle upon which the Bill has been draughted seems to be a recognition of the principle that a trader who wilfully misrepresents the nature of his goods so as to induce a customer to pay a higher price than he otherwise would have paid, as certainly robs that customer as if he had stolen his money.

The Bill in question, which is called the "Merchandise Marks Law Consolidation and Amendment Bill," as amended on report of Committee, can now be had of the Queen's printer for twopence; and the following are the points most likely to affect the photographic material trade. Any person who applies to goods any trade mark, or any mark so nearly resembling, as to be calculated to deceive, is to be liable to imprisonment, with or without hard labour, for a term not exceeding two years. But more than this, the same punishment may be inflicted on any person who "applies any false trade description to goods." Now let us see what is meant by "trade description" and "false trade description:" we quote from the Bill:—

> The expression "trade description" means any description, statement, or other indication, direct or indirect,
>
> (*a*) As to the number, quantity, measure, guage, or weight of any goods, or
>
> (*b*) As to the place or country in which any goods were made or produced, or
>
> (*c*) As to the mode of manufacturing or producing any goods, or
>
> (*d*) As to the material of which any goods are composed, or
>
> (*e*) As to any goods being the subject of an existing patent, privilege, or copyright,
>
> And the use of any figure, word, or mark which, according to the custom of the trade, is commonly taken to be an indication of any of the above matters, shall be deemed to be a trade description within the meaning of this Act.
>
> The expression "false trade description" means a trade description which is false in a material respect as regards the goods to which it is applied, and includes every alteration of a trade description, whether by way of addition, effacement, or otherwise, where that alteration makes the description false in a material respect, and the fact that a trade description is a trade mark, or part of a trade mark, shall not prevent such trade description being a false trade description within the meaning of this Act.
>
> The expression "goods" means anything which is the subject of trade, manufacture, or merchandise.
>
> The expressions "person" and "proprietor" include any body of persons corporate or unincorporate.
>
> The provisions of this Act respecting the application of a false trade description to goods shall extend to the application to goods of any such figures, words, or marks, or arrangement or combination thereof, whether including a trade mark or not, as are reasonably calculated to lead persons to believe that the goods are the manufacture or merchandise of some person other than the person whose manufacture or merchandise they really are.
>
> The provisions of this Act respecting the application of a false trade description to goods, or respecting goods to which a false trade description is given, shall extend to the application to goods of any false name or initials of a person, and to goods with the false name or initials of a person applied, in like manner as if such name or initials were a trade description, and for the purpose of this enactment the expression false name or initials means as applied to any goods, any name or initials of a person which—
>
> (*a*) Are not a trade mark, or part of a trade mark, and
>
> (*b*) Are identical with, or a colourable imitation of, the name or initials of a person carrying on business in connection with goods of the same description, and not having authorised the use of such name or initials, and
>
> (*c*) Are either those of a fictitious person, or of some person not *bonâ fide*, carrying on business in connection with such goods

It will be seen that the above provisions abundantly cover the case of French lenses now so largely sold by second-rate dealers as of their own manufacture, or marked with English names and addresses; but the prohibition of importation embodied in the following portion of the Bill is calculated to still further harden the way of the transgressors:—

> 16. Whereas it is expedient to make further provision for prohibiting the importation of goods which, if sold, would be liable to forfeiture under this Act; be it therefore enacted as follows:—
>
> (1.) All such goods, and also all goods of foreign manufacture bearing any name or trade mark being or purporting to be the name or trade mark of any manufacturer in the United Kingdom, unless such name or trade mark is accompanied by a definite indication of the country in which the goods were made or produced, are hereby prohibited to be imported into the United Kingdom, and, subject to the provisions of this section, shall be included among goods prohibited to be imported as if they were specified in section forty-two of the Customs Comsolidation Act, 1876.

Among the more respectable class of manufacturers and traders in Great Britain there is a very decided feeling in favour of the proposed measure, although some of those, whose business is based upon the sale of foreign goods as English, naturally feel dissatisfaction.

The Secretary of the Trade Mark Protection Society writes to the *Standard* of Monday last, suggesting that the proposed measure should not come into operation till the commencement of next year, and he makes the following remarks on the subject :—

> I am emboldened to ask the aid of the public Press in order that by the giving of publicity to this letter the Government may be induced to devise, by the aid of the law officers, some means of suspending the coming into operation of the new law until, say, the first of January, 1888.
>
> The intervening period would then in no way prove more than sufficient for exhausting stocks in the hands of retailers or in warehouses ; and at least partially to consume what manufacturers, in some instances at very considerable cost, have still under their own control. In pressing for the delay asked, I am giving expession to the wishes of those who desire to conform, but are at the same time naturally anxious to minimise the financial loss involved ; and, above all, to save their factors and retail agents from the annoyance and attendant risk of proceedings taken under the Act.
>
> Henceforth, when their labels, &c., have been remodelled so as to comply with the requirements of the Act, manufacturers will secure the full protection obtainable under registration. Illusory, in many instances, heretofore, have been the rights believed to be gained in respect of certain marks (mostly as labels) placed on the Register. As has been recently held by the Courts, no exclusive property can be maintained in that which embodies statements which are untrue in fact. There is no protection in equity against, nor possibility of obtaining damages in respect of, imitation of trade labels of this character ; so that the misrepresentation made by any one trader could be repeated *ad libitum* by any number of other traders, and the public deceived, as the case might be, by all or none.
>
> Manufacturers who for the moment may be under the impression that their interests are likely to suffer by the enforced system of truthfulness that must prevail in the statements in future attached to their goods will in the end discover that the contrary is the result.

Further, it is interesting to quote from a leader in the *Standard* of Tuesday last, and these remarks are as applicable to photographic objectives as to watches, foreign lenses being sometimes set in English mounts and sold by dealers as lenses manufactured by them. The *Standard* says :—

> If the Englishman can make the cover well, and the Swiss excel in the machinery, there is no reason why they should not combine to turn out the finished article. The difficulty arises when it comes to define the joint product of their efforts. Is a Geneva watch in a London case to be called Swiss or English ? As a matter of fact, "the trade" has long since answered the question by adopting the latter name. The "consumer," who knows nothing of these mysteries, buys a watch. There is the assay mark on the case, and the name of some English vendor or dealer ; and he is content to pay from ten to thirty per cent. more than he would if he bought the same watch and knew that it came from beyond the seas, so far as its most essential part is concerned. That he is defrauded is obvious enough, though how he can be protected without injury to innocent persons and the manufacturing interests is another question, which the Select Committee of the House of Commons may, perhaps, find it less difficult to answer than the practical experts examined by Baron de Worms and his colleagues.
>
> The proposal of the new Bill is that the place or country of origin shall be marked upon imported manufactured goods. There is a good deal to be said for the proposal, which no doubt will eventually be adopted in some form. At the same time, one or two of the witnesses were enabled to show that certain flourishing branches of trade from which the country derives considerable profit might suffer a good deal by it. Take the case of pipes, cheap brass ware, and the like, for which London is the great Colonial and Indian market. These goods are not made in England. Various towns in Germany are the chief producers. A few large importers sweep them up from the different corners of the Fatherland, stamp them with their own name and London address, and send them to Australia, Minnesota, or the Punjaub, as the case may be. It was argued with some plausibility that the Colonial agent would find a market for wares labelled Jones and Co., London," or "Smith and Sons, Birmingham," which he would not have for the ostensible and acknowledged productions of "Muller" and "Schmitz." It was also said that everybody knows perfectly well that the English name and address are only a piece of conventional ornamentation, as it were, not inscribed with "intent to deceive."

◆

EMERSON AND GOODALL'S "NORFOLK BROADS," AND EMERSON'S "PICTURES FROM LIFE."*

Perhaps, when photography has completed its first century of existence, it may be time for the historian to definitely trace out the influence which photography has exercised upon pictorial art, and also to chronicle the gradual inroad which art and artists have made upon the earlier notions of practitioners with the camera and the sensitive plate ; indeed, it is quite probable that the historian of fifty years to come may set down the present time as that period at which the artist and the photographer began to considerably influence each other, and when the tide of taste turned against some of the crude and early attempts to make the camera and the scissors instrumental in the production of works of pictorial art, and as a period when the merits of the neglected productions of some of the earlier workers in artistic photography proper were first thoroughly appreciated—a period when some great and real artistic merit was generally recognized in the works of Rejlander and of Julia Cameron.

In the early days of the sun picture, the boast and delight of the photographic manipulator rested largely upon the fact that his photographs represented nature with a detail and minuteness which no artist could approach—that his photograph, when examined with a magnifying glass, revealed details such as an observer would only see when looking through a telescope, and which no true artist would therefore care to reproduce, even if he were able so to do. At this period, the producer of a photograph often wrote or spoke as if the artistic merit of the photograph was greater than that of the picture, in direct proportion as the former was fuller of minute detail than the latter ; but the general public soon ceased to wonder admiringly at the marvellous minuteness of the photographic record, and they demanded from the photographer something which should fill the place of the picture– something which should interpret or exhibit nature in the fashion that nature manifests itself to the senses of mankind. They had, indeed, somewhat tired of minute map-like delineations of grouped shells, fruits, and other objects—also of chart-like representations of in and outdoor scenes, even though these were made with the best defining lenses, well stopped down, and made on plates and paper so finely surfaced as to record sharply every line and detail.

Then uprose Rejlander the artist painter, who saw in photography a tool of great strength, and who practically cast aside the brush in order to find the true method of using the camera. Rejlander's efforts in the direction of joining together portions of several photographs in the hope of constructing something which may possess sufficient of the elements of the picture to satisfy artistic longings resulted in a confessed and acknowledged failure, as far as Rejlander was concerned, although in Rejlander's time there were some few who became converts to the idea that great pictorial results might result from the use of the scissors and the piecing together of portions of photographs —the so-called "combination photography"—and there are a few who, by virtue of their considerable mechanical skill, have kept this branch of the constructive arts alive even to the present day.

Let it not be supposed that the *possibility* of constructing a combination of photographs which shall be truly a picture is denied by ourselves, or indeed was doubted by Rejlander; it is merely this. The cuttings to produce a good result must be made and handled by a master artist, indeed by one as great as the man who could and would paint his conception outright.

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* "Life and Landscape on the Norfolk Broads." By P. H. Emerson and P. F. Goodall. Illustrated with forty platinotypes.—London, 1886 ; Sampson Low, Marston, and Co., 188, Fleet Street.——"Pictures from Life in Field and Fen." By P. H. Emerson.—London, 1887 : George Bell and Sons, York Street, Covent Garden. (*Second Notice*).

The new type of artist photographer does not make any special effort to transcend nature by an unreal detail, such as the observer of the scene represented could only see if he used a telescope, neither does he care to give his figures that prominence of outline which can only come when the main source of light is from behind, combined with that full and bold detail of modelling on the view side which must be the result of the main light coming rather from the front, or at any rate not from the back. The combination photographer, by the use of his real or metaphorical scissors, can realise to the full both the above effects on one sheet—effects which, when both largely realised, are absolutely incompatible, and so he can produce a something which altogether transcends nature as the eye sees her, and consequently appeals to the instincts of the uncultured portion of the masses, who exclaim, "How wonderful!" and really feel delight at seeing here in one sheet two distinct phases, and they admire according to the *quantity* of representation crowded into the four sides of the frame.

In a previous notice of "Pictures from Life," we referred to "The Grafter" as one of the best interpretations of nature given to us by Emerson; but the main part of the face of the grafter is a patch of black, there are no details in one of his trowsers, the top of the stock which is being grafted is scarcely distinguishable, and a dozen other equally considerable faults might be argued against it by one who takes a conventional combination photograph, and not nature, as his ideal. The light is shining from the right of the picture on to the grafter's bended back, and this gives a sharp light outline against the dark background of wood and bush, this sharp outline extending about half-way down the figure, where the shade of the undergrowth so weakens the outline as to make much of it indistinguishable to the spectator who looks at the picture from a proper distance. And yet Emerson's picture is true to nature, as anyone can convince himself by seeking for a wooded place where the bright light breaks through here and there to the side of the observer, and posing a figure like "The Grafter." The combinationist could have obtained a far more striking result by working out the same conception in such a way as to include in one sheet several incompatible phases of nature, and his result would perhaps have, if put into a photographic exhibition, six admirers for one admirer of Emerson's picture.

In "Life and Landscape on Norfolk Broads" are forty platinotypes and a descriptive text; the whole forming a thick, handsome volume, which any person of artistic taste may feel proud to own.

Emerson quite recognizes that a picture representing nature must be essentially defective as regards the extent of the range between the highest light and the deepest shade; in other words, the artist must include his whole picture between narrower limits, and if he justly proportion all gradations to his limits, the result must generally be a picture tending towards flatness. Brightness or sparkle in a picture is often—or perhaps generally—the result of exaggerating the difference between certain gradations, and this can only be balanced by throwing an opposite error into some other part of the scale. Just proportion throughout is what Emerson aims at, and in the two series before us he seems to have realised it more completely than those who have gone before him in the paths of artistic photography. He is not always equally successful, as now and then the exaggeration of the difference between certain grades of tone which we are accustomed to in the conventional photographs steps in—we think we see it a little in "Setting up the Bow Net," especially as regards the glisten on some of the blades of grass and sedge; but as an example in which proportion is exceptionally preserved throughout, we may refer to "Poling the Marsh Hay," a picture which is typical of Emerson's best.

Now and then in the past we have seen occasional photographs such as Emerson now presents, but to him is due the credit of endeavouring to form a real and truthful school of photographic representation.

We hesitate to ask permission to reproduce, in block or other form, any of the pictures before us, as, in reproduction, they might—and probably would—lose their essential character; but we would suggest that at some time it might be possible to have an exhibition in London of photographic pictures by Emerson and his followers.

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THE SOLAR ECLIPSE.

To-day, a total solar eclipse will be visible along a long belt of country running from central Germany, where the eclipse occurs at sunrise, through Russia, Siberia, Northern China, Japan, and so into the Pacific. In Russia, a little army of astronomers and meteorologists from America, England, France, Germany, Italy, and Russia, have taken up their positions, and in order that no phenomenon shall escape a thorough investigation, another party of American observers has gone to Japan; and as the moon's shadow takes two hours to travel across the tract of country intervening between Russia and Japan, there will be ample time for the observers in Europe to telegraph the news of any strange comet, planet, or other unexpected phenomenon, to their colleagues in Japan. Moreover, the parties in Russia and Japan are provided with cameras for photographing the sun, with plates of the same make, and probably of the same emulsion, which are to have the same exposures, and which, finally, in order that the same conditions should occur throughout, are to be taken back to the States and developed by the same operator. In this way, if the set of observations be successful, we may possibly learn what changes are brought about in the corona by the rotation of the sun on its own axis.

Differences have been noted in photographs of the corona taken at places 300 miles apart, but they have been very slight, and in those taken in 1876, where the interval in time between the two exposures was about an hour, very little, if any, difference existed.

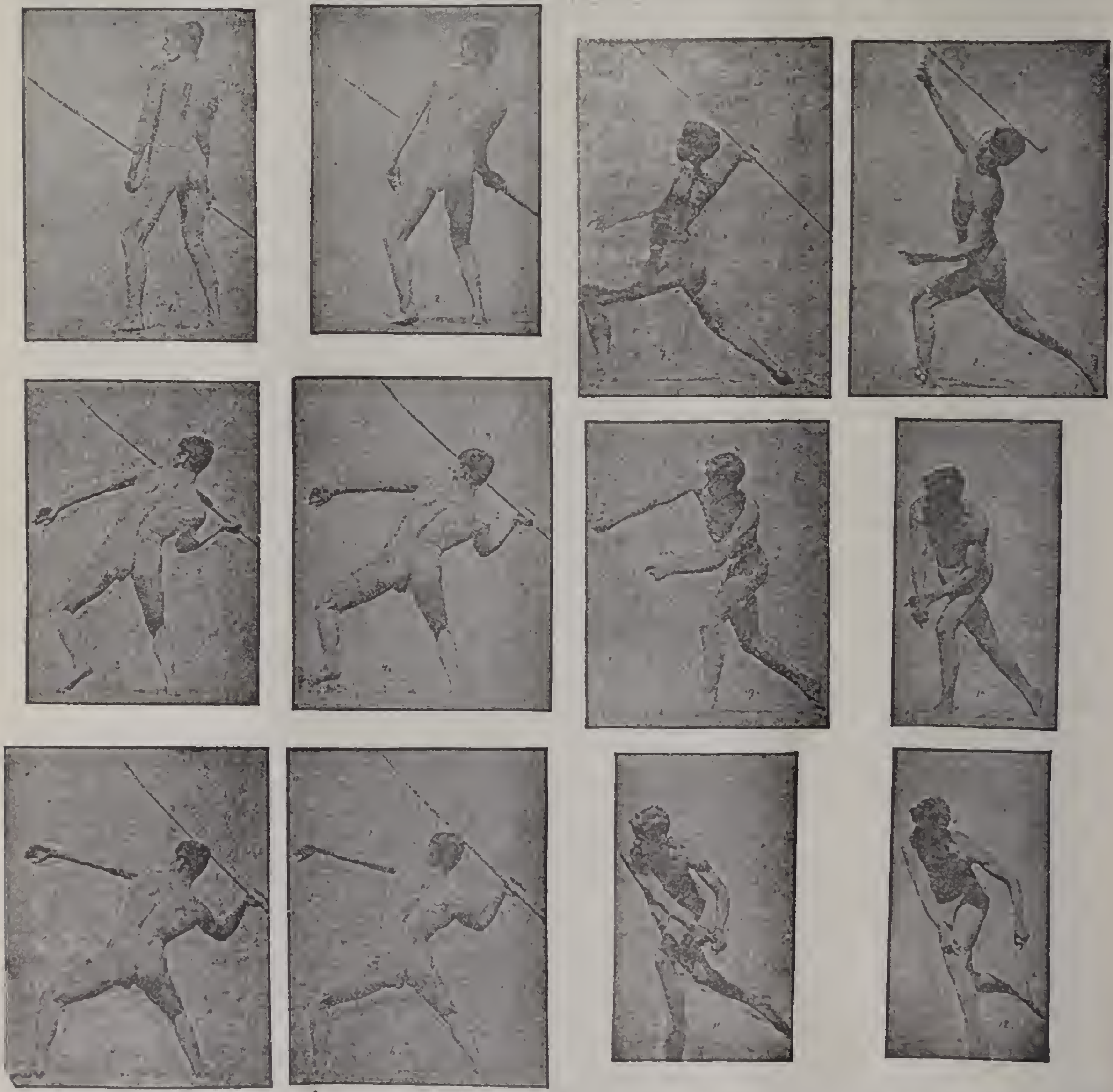
Another innovation, too, is to be tried this year: two Russian Professors, Nemekdieff, and Sverinzeff, will observe from a balloon: presumably they are meteorologists, as it seems difficult for anyone to do accurate spectroscopic or photographic work, except of an instantaneous character, from a moving platform. Still their observations will be useful, as they may show the effect of the passage of the shadow on the atmospheric currents. Certainly, after the eclipse in the West Indies, there was a smart blow for an hour or so, and in previous eclipses a similar thing has occurred.

At the present time there are two distinct hypotheses to account for the lines observed in the solar spectrum. Professor Young considers that the photosphere—the visible surface of the sun—is, on the outer surface, pretty sharply defined, although very irregular. Immediately above this lies the so-called "reversing layer" in which the Fraunhofer lines originate, the gases of which this stratum is composed forming the atmosphere in which the photospheric clouds float. Above this lies the scarlet chromosphere, with its prominences of various forms and dimensions; and over, and embracing all, is the coronal atmosphere.

Mr. Lockyer's theory, propounded by him in 1879, and which, he claims, is proved by the observations made in 1882 and 1886, is that there is no such thing as a reversing layer, but that owing to the intense heat existing in the sun, such metals as are common to the earth and sun are dissociated into their constituents, and that those atoms which are incapable of existing at a high temperature exist at a greater distance from the sun than other atoms which are not broken down by the excessive temperature, and that the dark lines in the solar spectrum are the summation, so to speak, of the absorption of several successive layers which he thinks may extend into the coronal atmosphere, far above the chromosphere. It is understood that Professor Young, who is in charge of one American party in Russia, intends to make observations with the intention of deciding between these rival theories.

As regards the coronal atmosphere, but little is known. It seems to be a vast atmosphere of incandescent gas, extending possibly for over a million miles from the sun's surface; it probably contains suspended in it liquid or solid particles which reflect the solar spectrum, as Janssen has seen dark lines in its spectrum. Of the nature of this incandescent gas, at five hundred thousand miles from the sun's surface, even less is known; the 1474 line has been seen in it, H and K, and another line in the violet, seem to extend above this distance. Below this elevation more than thirty lines were photographed and recorded in the Egyptian eclipse, so it is to be regretted that many of the observers are taking their observations by eye instead of availing themselves of photography, as in the two-and-a-half minutes at their disposal they certainly will not be able to fix with absolute certainty the position of more than four or five lines.

In England very little of the eclipse is visible. The sun rises eclipsed, but nine minutes after sunrise the moon will have passed away from the sun's limit. During this century only eight total eclipses of the sun have been visible in Europe, and since A.D. 538 only three have been visible in England. The next total eclipse in these islands seems to be that of 2290, and that only in the extreme north, just after sunrise.



INSTANTANEOUS PHOTOGRAPHS OF A LANCE THROWER.

In a recent issue of the *Photographische Correspondenz* we find reproduced a series of instantaneous photographs by Ottomar Auschutz, showing some of the various positions assumed by a lance-thrower; and these representations possess much scientific interest, to say nothing of the lessons which an artist may learn by an attentive study of them. Anschutz, having proposed to study photographically the muscular action of the human body under severe strain, found a suitable subject in a well-built young soldier of the Lissa garrison, and he secured the accompanying series of no less than twelve phases of the act of throwing the lance. The original negatives were somewhat smaller than the reproductions.

It will be seen that the figures are numbered with small figures between the legs of the man, and the order is two groups, each in usual reading sequences.

PHOTOGRAPHY IN JAPAN.

BY W. K. BURTON.

A few words as to the condition of photography in Japan may be of interest to some, and particularly to any who may think of visiting the country.

I arrived here only a fortnight ago, but was not allowed to remain long in ignorance of the fact that in matters photographic, as in others, the Japanese are coming well to the front.

Before entering on this question, however, a few words on another. There are often discussions as to packing of plates and of apparatus for long voyages. As I have come about 12,000 miles without suffering any loss beyond the breakage of the ground glass of one of my cameras, and this in spite of the fact that my boxes received the very roughest usage, it may be interesting to know how the things were packed.

Two cameras, one 12 by 10, the other $6\frac{3}{4}$ by $4\frac{3}{4}$, and seven lenses– the largest a $3\frac{1}{4}$ inch portrait combination, the smallest a portable symmetrical of 10 inch focus—were placed between two layers of clothes in a large Saratoga trunk. I took only a few dozen plates with me, some of 12 by 10 inches, the others of $6\frac{3}{4}$ by $4\frac{3}{4}$. These were packed in the boxes with paper-lined metal grooves made by Arundel and Marshall, of London. I think these boxes decidedly deserve a good word to be said for them. Their convenience is great; the grooves being metal, the boxes may be often refilled; and they seem to allow of very rough usage without being themselves damaged or allowing the plates to be broken. The boxes were placed, like the cameras, between layers of clothes in the Saratoga trunk, and the way in which this trunk was treated was such that I scarcely expected to find a whole plate when I opened it. An American porter's idea of how to move about a box when it is too heavy to lift it appears to be to roll it over on its ends, top, and bottom. It is not a cheering sight to see a box which contains cameras, plates, and lenses, going bump, bump, in this fashion along a stone floor; but there is no help for it.. Remonstrance has no effect whatever. This sort of treatment was repeated at each of some six or seven "depôts" on the way across America. It was bad enough, but worse was to come. All luggage had to be transferred in Yokohama Bay from the steamer to a small tender, the water of the Bay being too shallow to allow large vessels to come close to shore. My unfortunate box, being very heavy—about 300 lbs. in weight—was being lowered in rope slings over the side of the ship; it had only got well over the edge when it slipped from these, and fell a height of about eight feet on to the deck of the tender. Of course I expected that the 12 by 10 plates, at any rate—they being supported only at their ends in the grooves of the box—would be smashed to bits. I was, therefore, agreeably surprised to find that not a single plate, either large or small, had suffered. It is on this account that I think the boxes I have mentioned really deserve to have attention called to them.

A few exposures were made on board the steamship, *City of Sydney*, whilst crossing the Pacific. The Pacific, by the way, scarcely kept up its reputation for peacefulness and it was only as we neared Japan that there was a day calm enough to make the manipulation of a camera on the deck at all a promising performance. It was at this stage, when I was about to expose on board the ship, having unpacked my box for the purpose, that I discovered the breakage of the ground glass of one of the cameras. No ground glass was to be had on board, nor was any flour emery, with which a piece of plain glass might readily have been ground; so I had to make shift by taking a gelatino-bromide plate, soaking the film till it swelled, melting it by placing the plate on the corner of the high-pressure cylinder of the main engine, and allowing the greater part of the emulsion to run off, thus leaving a thin film.

I should not have mentioned the exposures on board ship but that I learned a lesson from them—viz., that on account, probably, of the great amount of reflected light from all directions, and the consequent absence of any deep shadows, a very short exposure only is needed for groups, &c., on board ship. This might have struck me before, rather than after, I had made some half-dozen exposures, but it unfortunately did not; and I found that plates exposed on groups in diffused light were almost hopelessly over-dense with times of half to quarter second, and stop No. 16 U. S. ($\frac{f}{16}$), the plates being rapid, but not extraordinarily so. One-half or one-third of the exposure would have been sufficient.

I had not been five minutes in the Grand Hotel, Yokohama, when a "Guide to Yokohama and Tokio" was presented to me. On looking at it, I found that the guide was got up by an enterprising photographer in Yokohama. I soon had an opportunity of judging of the quality of work turned out by him and by two or three other professionals, most of them Japanese, and came to the conclusion that it was at least up to the average of English landscape work. Nor is this to be wondered at, for there is a vast choice of subjects here of a most photographable nature, and the light is exquisite. It is an almost universal practice to colour landscape photographs in Japan. In so great disfavour is the colouring of prints on albumenized paper generally held at home, that it is very difficult to overcome the strong prejudice that one feels against the practice; but it must, on consideration, be admitted that, in Japan, it is at least a much more excusable practice than in England. Landscape photographs are generally purchased here, by visitors, to take home to give some idea of the country to their friends, and as a matter of fact, no idea—or, rather, only half an idea—can be given if the element of colour be left out of the pictures. Colour is of importance enough at home; but it is of very much greater importance here, where its vividness is something it is impossible to describe. Especially is this true of the greens. The most gaudy colouring cannot show them as more brilliant than they are.

Then, again, the colouring of photographs has probably fallen into disrepute rather because it has been badly done, than because there is anything essentially vicious in a painted photograph, and the Japanese are well known to be most skilful in the use of colours.

In the Gallery of A. Farsari and Co. I had the pleasure of seeing the native artists at work. They were to be seen busily engaged in a large room, each artist in the position almost universally adopted by a Japanese for his work, namely, squatting on a straw mat.

Straw mats form almost the sole furniture of Japanese rooms, either for dwelling or for working. The men, women, and children squat on them during the daytime, and sleep on them at night, and very comfortable they are to sleep on; but the squatting is a thing not possible to the average European. A Japanese kneels down, then quietly bending his knees sits on his feet, the toes being extended straight backwards. Let any of your readers try the attitude, and report the result. The writer's attempts resulted in the most lamentable failure. Of course a worker sitting as described requires a very low table only;

indeed, his work-bench is more like a very low stool than any other European article of furniture that I know of.

Farsari's artists were very slow and careful in their work. He informed me that he was satisfied if each coloured two or three prints in a day. This allows time enough for each print to be really well-coloured, and, indeed, I have seen no better work in the way of coloured photographs anywhere than some of Farsari's productions. There is, at least, one dealer in photographic requisites in Yokohama. There is also, at least, one Japanese plate maker. I have not yet been able to judge of the quality of the plates he turns out, but hope soon to do so.

Chemicals are to be had at very moderate rates, and of guaranteed purity. I mean actually guaranteed by the Government, which allows no chemicals to be sold till they have been examined at the Government laboratory, have proved to be of a high standard of purity, and have been stamped with a Government stamp, indicating that the examination has been made. This applies, at any rate, to all chemicals that may be used as drugs, and, therefore, applies to most of those used in photography, and others also, I believe; but of this latter I am not certain. The examination, I understand, is no perfunctory affair, but is a very genuine one. Might not some countries, whose people imagine that they are far more civilised than the Japanese, take a hint in this matter?

Of the amateur element there seems to be scarcely anything in Japan at present. Many amateurs have visited the country, and have exposed plates in it; but of residents there are, at present, so far as I know, only some three or four, including myself, who practise photography as an amusement.

At the College of Engineering, photography is more or less used for scientific purposes, apparently the wet process only being worked. The "blue process" is used for copying tracings.

It will soon be holiday time with me, and I intend, when it is, to take a small camera with me right into the interior. I shall endeavour to get to places where no "white man" has yet been; although I am by no means confident of being able so to do, as there are now but few such places left. At any rate, I am pretty sure to meet with some things of interest enough to be worth communicating to British readers; and I may possibly be fortunate enough to get some pictures which may be different enough from anything we have at home to be worthy of reproduction. This, however, remains to be seen. I intend to take with me only a camera, two lenses, and about half a gross of plates. The mode of travelling is by "jinrikisha," a jinrikisha being a small two-wheeled carriage drawn by a man. The hire for carriage and man is only some 2s. 6d. a day in the country; of course, the weight that can be carried is limited, although it is extraordinary what burdens a good jinrikisha man can carry, at what rates, and for how great a distance. On flat ground a good runner will keep up a rate of eight to nine miles an hour for several hours, and show scarcely any signs of distress at the end of that time.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTE.

BY CHAPMAN JONES.*

Chapter VIII. (*Continued*). — Reflection — Plane Mirrors—Reversed Negatives, etc.—Concave Mirrors—Production of Real Images—Spherical Aberration.

In figure 5, the back of a looking-glass with its metallic coating is represented by the thick line, the passage of a ray is shown by the continuous line, and the broken lines indicate the reflections that produce false images. Several images so formed may easily be seen by holding a lighted candle in front of a looking-glass and looking at its reflection obliquely. The refraction or bending of the pencil of light, as it enters the glass, will be discussed subsequently.

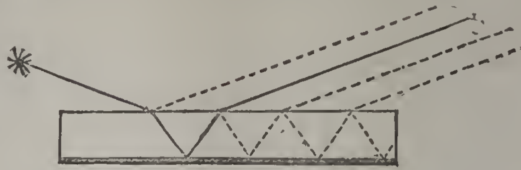


Fig. 5.

A concave mirror causes the pencils of light that impinge upon it to converge, the law that the angles of incidence and reflection are equal applies to all reflecting surfaces, and it is therefore not difficult to trace upon paper the effect of any mirror upon the direction of any ray of light. In the figures 6, 7, and 8, the arcs that stand for curved mirrors are struck from the points marked C, and this point is called in each case the centre of curvature of the mirror.

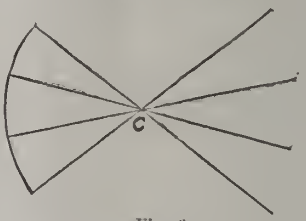


Fig. 6.

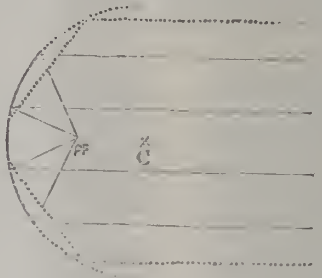


Fig. 7.

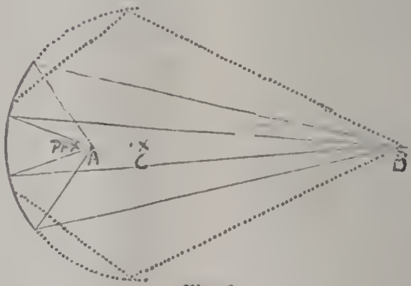


Fig. 8.

If a luminous point is placed at the centre of curvature of the mirror, the rays emanating from the point travel in the direction of radii of the sphere of which the mirror is a part, and those rays that impinge upon the mirror are reflected back along their original paths to the luminous point, and add their effect to the light emanating in the opposite direction, as shown in figure 6. This is the part that should be played by the reflector in optical lanterns, enlarging apparatus, &c. The size of the mirror should be such that when the condenser, the light, and the mirror, are properly placed, the diverging bundle of reflected rays fully cover the condenser. For such purposes the spherical concave mirror is what is theoretically required.

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* Continued from page 404.

If the luminous point is moved to the position half-way between the centre of curvative and the surface of the mirror, the reflected light forms a bundle of approximately parallel rays as shown in figure 7, excluding the dotted lines; and, conversely, if parallel rays impinge upon such a mirror, they are brought to a point or focus half-way between the centre of curvature and the mirror, and this point accordingly is called the "principal focus." It is a mistake to suppose that by putting a luminous point in the principal focus of a concave mirror we have *only* parallel rays opposite the mirror; the parallel rays produced by the mirror mix with the divergent rays emanating directly from the luminous point itself, and at a certain distance from the mirror, which may easily be demontrated geometrically, the parallel and divergent rays are sensibly equal in intensity. Nearer the mirror than this the bundle of divergent rays is more intense, and further away it is less intense, than the bundle of parallel rays. If light from so distant a source that the rays are practically parallel impinges upon a concave mirror, it is concentrated at the principal focus of the mirror, as shown in figure 7, but this concentration is only approximate, though it is drawn as if it were exact so far as the unbroken lines go. The dotted lines of the figure show that if the curve of the mirror is continued, the concentration at the principal focus is not even approximate. This lack of focussing power is called "spherical aberration," and it is always present in spherical mirrors, though in a mirror of small angle* it may, under certain circumstances, be practically neglected.

In figure 8, it is obvious that a point of light, such as B, that is further from the mirror than its centre of curvature has its light that impinges upon the mirror brought to an approximate focus at a point between the principal focus and the centre of curvature at A. Conversely, a luminous point at A would have its light concentrated at B, and these two points, or any pair of points similarly related to one another, are therefore called "conjugate foci." Spherical aberration in this case is also shown by the dotted lines.

If one luminous point is reproduced, so to speak, by having a part of its light brought to a point in a different place, it generally follows that other luminous points will be correspondingly reproduced, and as a visible object may be regarded as an infinite number of luminous points, we have here all the conditions necessary to obtain a true image—true in the sense that it may be received upon a screen, and may, therefore, be photographically fixed upon a sensitive surface. A camera with a concave mirror instead of a lens was used by some in the early days of the Daguerreotype process, but such an apparatus is not readily amenable to modification, and allows much stray light to reach the sensitive surface. Moreover, as the sensitive surface, or a second mirror, must be between the object and the mirror, a considerable amount of light is stopped, unless the mirror is large as compared with the sensitive surface. But in stellar photography the mirror has very many advantages over the lens. It can be made larger, and, therefore, to form a more brilliant image; and as it is absolutely free from chromatic aberration the whole of the chemically active light is brought to a focus exactly where the visible image is formed, an advantage that no practical combination of lenses can effect. As the light from stars is feeble, the stray light is not dangerously great; and as the plate used to receive the image is not large, it does not cause, either directly or indirectly, an important barrier between the mirror and the object.

Convex mirrors do not produce real images, and as they are not useful in the practice of photography, we are not called upon to discuss their properties.

(To be continued.)

ROYAL CORNWALL POLYTECHNIC SOCIETY.

The fifty-fifth annual exhibition of this Society will open on Tuesday, 6th September, at Falmouth, and will continue for five days. No charge will be made for space.

The following are the regulations:—

1. All exhibits must be forwarded so as to reach the Polytechnic Hall, Falmouth, not later than Tuesday, August 30th, after which no article will be eligible for competition, and no space can be guaranteed.

2. All pictures and photographs must be framed; and if left at one of the following places of the Society's authorised agents on or before Tuesday, August 23rd, will be conveyed from these depots to and from the Exhibition free of charge, namely:—Worth and Co., Cathedral Yard, Exeter; Harris and Sons, 197, Union Street, Plymouth; J. Mitchell, 37, Fore Street, Devonport; Thomas Solomon and Co., King Street, Truro. Agents will not receive any article unless delivered to them free of conveyance and other charges.

3. The carriage of all other articles must be paid by the exhibitor.

4. All cases and packages sent to the exhibition must be addressed "The Royal Cornwall Polytechnic Society, Falmouth," and must bear the name and address of the owner; the covers to be fastened with screws. The exhibitor must write on the back of each picture his name and address, its title, whether it is an original or a copy, the name of the artist, and whether he is a professional or an amateur. The works of professional artists may be sold from the gallery, through the Secretary of the Society, Mr. E. Kitto.

5. Exhibitors must enter all articles intended for exhibition on forms provided for that purpose by the Society, which may be obtained from the Secretary, or any of the above-named authorised agents.

6. The form must in all cases be sent to the Secretary, on or before August 20th.

7. The Society will not be answerable for loss of or damage to any article sent to the Exhibition, but every care will be used to prevent injury while in the Society's possession.

8. After admission no article may be removed until after the close of the Exhibition.

9. Discretionary power is vested in the officers of the Society as to exhibiting any article sent.

10. Board of Trade protection is granted to all inventions.

The judging will take place on Monday, September 5th.

Subjoined are particulars specially applicable to photography.

In all cases state whether the work is professional or amateur, and name process of production. All work sent for competition must have been executed within eighteen months of the date of this exhibition. Carte de-visite portraits are excluded from exhibition, except when illustrating some special process or novelty.

Professional Photographers.—Medals are offered by the Society for meritorious productions in the following subjects:—Landscape, portraits, composition pictures, instantaneous pictures, interiors, transparencies for lantern or window decoration, pictures by improved processes, and enlargements. (All enlargements for competition must be the work of the exhibitor.)

Amateurs.—Medals are offered for meritorious productions in this department.

Photographic Appliances.—Medals are offered for improved apparatus and appliances, including magic lantern apparatus, &c. All exhibits in this department must be accompanied by a written explanation of their specialities.

Note.—Regulation 7 does not apply to the photographic department for this year.

All further information may be obtained from the Secretary, Edward Kitto, F.R.Met.S., Polytechnic Hall, Falmouth.

Notes.

If the new Trade Marks Bill becomes law—as no doubt it will—in something not much differing from its present form, the trade in French lenses marked with the names of English dealers must cease. Often these dealers do not, in so many words, profess to be the actual manufacturers, though sometimes they do; but for the purpose of the Act the addition of the name and legend "Snooks, London," would no doubt be held to constitute a statement that the instrument was by Snooks, of London. Some particulars as to the new Bill will be found on page 513.

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* That is, a mirror that forms only a small portion of the sphere of which t is a part.

We have heard something about the hardships to which English tourists have been subject when sketching or photographing near French forts in contravention of published regulations, but all these are as nothing to the gratuitous outrage committed by our police authorities upon a grey-headed and infirm French woman who landed at Cowes last week. She had some modelling clay, and it appears that some malicious person wrote—it is believed anonymously—to the Deputy-Governor to say that the lady would land with dynamite in her bag. This obtuse official, instead of engaging the services of some individual who could tell the difference between modelling clay and dynamite, and having the lady's luggage examined quietly, actually caused her to be taken into custody; and, on absolutely no evidence of guilt, she was remanded for two days on the charge of having dynamite in her possession. Photographers and others who carry chemicals or apparatus had better keep clear of the Isle of Wight while A. H. Estcourt is Deputy-Governor; but after such a proceeding one can hardly expect that he will remain in office long, and it is to be hoped that questions asked and answered in Parliament will serve to show the public what sort of a communication this Deputy-Governor considered sufficient to justify him in arresting the French lady.

Just now photographic prices tend a little towards lowness, even in old-established studios. Indeed, it seems as if "Euston Road prices" tend to invade studios of repute, as one of the few photographers entitled to call himself photographer by special appointment to the Queen will supply a single carte, "ordinary, full, or half-length," for one shilling and sixpence.

One source of the above information is a whole-page advertisement in the Catalogue of the Civil Service Supply Association (page 1047 of last issue), in which advertisement it is announced that a photographer to the Queen most cordially thanks his patrons for the support they have given him for nearly half a century, and invites their attention to a list of prices.

Besides the single carte at one shilling and sixpence, we note one cabinet "ordinary, full, or half-length," three shillings; ditto, best finish, vignette or cameo, five shillings; and also "the 'specialite' newly introduced. A ten by eight porcelain picture, handsomely framed, for one guinea, or with a dozen cartes or six cabinets twenty-five shillings."

Satisfactory as the above prices are from a sitter's point of view, there are still better terms for members of the Stores—twenty per cent. discount on fully prepaid orders of ten shillings and upwards. The advertiser in question is only one of many who make special prices for the Stores and their members, and the system of having two prices is one which the photographic profession would do well to consider: indeed, this is a matter which the Photographic Convention might well take in hand.

Those photographers who have suffered from bichromate poisoning may perhaps derive a little consolation from the investigations of a writer in *Science* (New York), but will probably not be induced to expose themselves again to its dangers by the concluding statement of the investigator—viz., that he "has not been able to show that chrome dye, or, indeed, any modification of chromium, is in any way poisonous to the human body." But when he makes this assertion he confines himself to the "insoluble modifications of chromium." The result is far different in the case of the soluble salts, as more than one photographer has reason to know. He says that the alkaline chromates do produce sores and sloughing under certain conditions: (1) if they fall in quantities upon an abrasion of the skin, or (2) upon the delicate mucous membrane. Speaking generally, a solution containing 150 grams of an alkaline chromate in one litre of water is scarcely strong enough to produce sores upon the hands. The result of enquiries among the workers in a bichromate factory showed that though they lived in an atmosphere visibly charged with alkali chromate dust, yet they were as healthy as people in other occupations. But this is to be said: every man who worked exclusively within the factory had the nasal septum partially destroyed in from eight to twenty weeks. The action then ceases, and there is no further inconvenience.

Some experiments made with bichromates are worth recording. 1. Three healthy men were exposed for four hours to an atmosphere containing vapours from boiling sodium bichromate, *i.e.*, vapours visible in a beam of sunlight. 2. Two healthy men were exposed twenty minutes to an atmosphere containing visible clouds of dust of neutral sodium chromate. 3. The lower half of a shirt sleeve was saturated with a ten per cent. solution of potash bichromate, and then bound round the arm from wrist to elbow, remaining in contact with the skin three hours and kept moist. No unpleasant results followed any of the experiments mentioned. The moral of the article in question from a photographic point of view is, a careful examination of the hands before using a bichromate solution. But with the utmost care a scratch might escape notice, and india-rubber gloves should be worn if risk is to be entirely avoided.

It would be very desirable if legal luminaries could make up what they are pleased to call their minds in regard to the interpretation of the Artistic Copyright Act. Directly a question of copyright comes into a Court of Law, then confusion commences. The action of Tuck *versus* the Continental Printing Company, just brought to a conclusion, is a case in point. The plaintiffs employed the defendants to produce copies of a certain picture. The work was done in Berlin, and the defendants not only executed the order, but produced some copies on their own account without the knowledge and consent of the plaintiffs. The pirated copies were imported into England and sold, and thereupon Messrs. Tuck took legal proceedings, claiming penalties under Sec. 6, and damages under Sec. 11, of the Copyright Act of 1862. At the trial Mr. Justice Day, after directing the jury to assess the penalties and damages separately, held that the defendant was entitled to judgment in his favour in respect to the penalties assessed at £175, but gave judgment for the plaintiffs in the question of damages, amounting to £100. Defendant then appealed to the Divisional Court, and Justices Grove and Denman gave judgment in his favour both as regards the penalties and damages. The plaintiffs naturally were not satisfied, and they went to the Court of Appeal, when the Master of the Rolls and Mr. Justice Lindley gave judgment for the plaintiffs on the question of damages to the amount of £30, but held that the defendant was not liable for the penalties. From this judgment Mr. Justice Lopes dissented, so that had there been a higher court to go to, no doubt the pendulum of the law would have swung back again to the benefit of the plaintiffs.

In looking over Sections 6 and 11, it is difficult to see why there should have been so much difference of opinion. The phraseology is extremely verbose and tautological, but the meaning is very plain. The two sections are almost identical, the first relating to the penalties to be imposed upon anyone who imports into England pirated copies of a copyright picture, and the second providing that every proprietor, in addition to the remedies given for the penalties, may recover damages by a special action. Possibly the judges thought that the damages alone met the case, and that the penalties were superfluous.

The Princess Beatrice, says the *Court Journal*, has taken up photography, and has produced some very creditable pictures. We do not know whether this is good or bad news. It will certainly be a bad look-out for Court photographers if the members of the Royal Family take to photographing each other. But what an enormous sale such photographs would have!

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.*

The city of Naples is built in two extinct craters, and on examining the rock we found it be composed of soft yellow volcanic tufa, which is largely used for building purposes. In making a tour of the Phlegrian fields from Naples you come first to the extinct crater of Agnano. This was lately a shallow malaria-producing lake about two and a half miles round; it is now drained and cultivated. We passed the celebrated Grotto del Cane, where are kept a few unfortunate dogs, cruelly tortured by the fumes of carbonic acid into apparent death, for the (supposed) benefit of tourists! preferring, on every account, to see live dogs to dead ones, we passed by the other side, and made for the next crater—that of Astroni. This is one of the most perfect craters of the district. It has for long been kept as a royal hunting ground, and is a preserve for deer and wild boar. A stiff, hot pull up a winding carriage road, brought us to a military-looking gateway, situated in a gap that has been cut for it in the side of the crater. The custodian politely intimated that we could not enter without a permit from the Royal Palace at Naples. We argued with him, told him we had come from England to see it, and showed him a franc; he looked around, and seeing no king or royalty about, he in his turn was frank with us, and by expressive Italian gestures he made us understand that he would no longer prevent our entering. Astroni is a lovely place; from the road, soon after entering, you look over the whole from a seated platform; a good road descends, and winds through the woods; the sides are very steep, but the top is walled entirely round to keep it still more private. There are three lakelets, one of which is very deep; a royal hunting lodge is the only building in the bottom, and in the centre rises a mound of lava. Leaving, and descending to the plain, we proceed by a path through some miles of brushwood and vineyards, in search of the Solfatara, a semi-extinct volcano. The kindly natives gave us directions that entirely differed one from another, and had we followed them, we might have been wandering there yet. For this valuable information they asked for money or tobacco.

A sharp pull up among the hills brought us to a cottage, where a dark-eyed mountain-maiden speedily conducted us to a height overlooking the bay of Pozzuoli; here she stood for a moment, a picture of Italian rustic beauty, and pointing to what looked like a white field far below, she murmured softly, "Solfatara," and after we had crossed her palm, she disappeared like lightning back down the rocky path. We stood drinking in the scene before us; the Phlegraan fields torn and rent by volcanic action lay beyond the lovely bays of Baiæ and Pozzuoli, the white field of the Solfatara was just below the high bank of rocks upon which we stood, and from its crevices, sulphurous fumes and steam arose. This was the crater edge, but where the chief opening? We climbed quickly down the steep sides, and when near the bottom, came upon two common kitchen chairs, with men to hire them out! This was *too* much, it might do in Hyde Park, but why here? The explanation was at hand: a cave above six feet high was in front of the chairs, and out of it issued immense volumes of steam. This, then, was the chief crater of the Solfatara. We soon removed the obnoxious chairs and photographed the opening. The men crawl into the cave to fetch out hot sulphurous rocks and other chemicals which they have probably placed there for the purpose. Seeing one of these men enter, I rashly followed, but whether I omitted to stoop low enough, or went in at the wrong time, I know not; I only know that my exit was much more speedy than my entry, and that I narrowly escaped spoiling my complexion for life. Some men were cutting brush wood, and sending it down a wire from the rocks above, in bundles, to a cart.

The floor of the valley is covered with a grey powder, the real name of which is ceramshalite, or sulphuretted potter's clay. The ground sounds hollow, and rumblings of boiling water are heard at times.

Passing through the Solfatara, you soon enter Pozzuoli, where are to be found picturesque corners, and many subjects among the inhabitants, for instantaneous pictures. The dancing of the tarantella by pretty country girls to the accompaniment of a tamborine, was going on, but unless by the aid of a detective camera, it would be difficult to portray such graceful movements.

We visited and photographed the Temple of Serapis, which, as a proof of the changes in altitude to which some lands are subject, is a standing dish with geologists. This temple existed long before the Christian era; three large pillars are still standing, somewhat out of the perpendicular, and inclining towards the sea; they are above forty feet in height, and have each been carved out of one piece of marble; their surfaces are smooth and unimpaired to the height of about twelve feet above the pedestals (which yet stand in water). Above this is a zone of nine feet in height, where the marble has been pierced by a species of marine bivalve (Lithodomus); the holes this creature makes are pear-shaped, the external opening being about half an inch wide, and extending in width inwards, as the bivalve enlarged in size; thus the land whereon these pillars stand, has sunk considerably at some distant time, and has risen again.

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* Continued from page 502.

The amphitheatre above the town is a beautiful remnant of ancient architecture. It is well taken care of, and one franc is charged for entrance. Being hot and tired with our long morning's work, we obtained a bottle of water from the custodian, and took our lunch at the top of the theatre in lazy enjoyment of the view of the sea and distant Capri. Days might be spent here in sketching and photographing. Down in the basement, among broken arches and fallen marble columns, overgrown with luxuriant maiden-hair, the sunlight streamed through the ruins in dazzling contrast to the dark moss-grown corridors, and lighted up the masses of beautiful creepers which hung through the broken roof. This amphitheatre held 35,000 people, and has been the scene of many a terrible gladiatorial combat.

About a mile from Pozzuoli is the truncated cone of Monte Nuovo, singular amongst its brethren from its having been the latest thing in volcanoes. It is a hill of truncated conical form, one and a-half miles round, and 440 feet in height, which was thrown up during two days and nights in 1538. For two years previously the country round had been disturbed by earthquakes, which grew more and more intense. On the morning of the 29th September a depression of the ground was noticed, from which cold, and afterwards tepid, water issued. Four hours after, the ground was seen to swell up and open, forming a gaping fissure, within which incandescent matter was visible. Stones the size of an ox were thrown up, with vast quantities of pumice and mud. This went on for two days and nights. People ascended the hill, but the ejections began again, and some were killed. Monte Nuovo can be ascended in seven minutes. An ominous cloud gathered as we went up, and the sun hid his face during our tarriance and photographic operations. The height by barometer to the lowest part of the lip of the crater was found to be 300 feet. There is no table land, so that it is impossible to obtain a photograph of the whole circle. While trying to find a satisfactory point of view, I gradually descended the winding path, and in baffled desperation rushed to the bottom of the crater. I am glad I did so, for I had the satisfaction of finding its depth equal to its height, it being exactly 300 feet deep. I took one view at the bottom, which has lately been raked up for cultivation, and running across to the other side, I took another through the small trees; then grasping my camera and box in one hand, by the help of the bushes I climbed the nearly perpendicular side of the crater, and was thankful to reach the top. In a few minutes we were in the small hotel near the foot, and he who had climbed but 600 feet put away as much maccaroni as I who had accomplished 1,200.

Lava, pumice, and volcanic products generally, crumble into good soil with time, and during the past two years many fine terraces have been planted on the slopes of Monte Nuovo, by the shores of the famed lake of Avernus. This circular basin is more than 200 feet deep, and is the crater of an extinct volcano. It was used by the Romans as a harbour for their fleet, and a canal, which was afterwards filled up by the formation of Monte Nuovo, connected it with the sea. It was said that no bird could fly over the water, owing to the fumes arising therefrom. Time has altered that, and now only the water is poisonous, as many an unfortunate fish finds out, after working up the narrow stream to it from the sea; their carcases are to be seen floating on the surface. The surrounding mountains and ruins are rich in classic and poetic associations, and the ancient crater lake has a unique loveliness of its own.

Close by, on the road to Baiæ, you pass the Lucrine lake, still famous for its oysters. Many pictures by great artists have been painted along the shore and among the ruins of Baiæ, and the lofty old castle and shipping furnish good subjects for the camera.

The Cape of Misenum is the furthest point. It was here that Pliny was stationed with the Roman fleet at the time of the destruction of Pompeii; he was sent for to the city, and lost his life while investigating. Misenum is a cone of tufa much washed away by the sea. Small boys led us up the steep winding pathway to the top, over 500 feet. The view from thence is very fine; immediately below is the crater, with a lighthouse on the outside edge. We look back over the country we have traversed, once a seething mass of active volcanoes, now a smiling, cultivated tract, teeming with historic interest. The eye wanders on past Puteoli, and before reaching Naples discovers yet another crater in the island of Nisida. There is a military station here, and good wine is grown on the steep sides of the small crater lake, which is now a harbour.

We gave the two urchins all our coppers, and there being an odd one, they were sorely puzzled as to the division of the spoil; on reaching the foot of the hill they laid the case before their elders, who, probably understanding the rule of multiplication better than that of subtraction, evidently advised them to ask for one more sou, but they sued in vain.

The Monastery of Camaldoli is grandly situated on a height above Naples. We were shown over the grounds and chapel by a kindly looking old monk in cream coloured gown and cowl, and whose slippers might have graced the feet of an elephant. Fra Stanislaus is one of the few remaining monks; we could understand a little of what the old man said, and we gathered that he had entered the monastery at the age of twenty, and had been there forty-three years without ever leaving the premises.

He stood in an old hollow tree for a photo, and for another, on a long curved seat overlooking Naples, a seat which, if it were marble, would be the kind of thing which Alma Tadema would delight in. We failed to see how the old man benefitted himself or mankind by his forty-three years of seclusion, but a kindly look beamed from his eyes.

The Carnival was at its height when we left Naples. During one day, carriages were not allowed down the great street of the Toledo, it being reserved for processions The lamps were protected from breakage by having baskets put over them. Great carts with erections, crowded by grotesquely dressed people, many of them clothed in white. who, with tin spoons, ladled out quantities of lime wherewith to deluge pedestrians, paraded the main streets. Woe to the man who, through not being on the look-out, received a dose of lime in his eyes.

The theatres were doing a brisk trade, and, seeing "L'Africane" advertised for nine o'clock at the Bellini theatre, we attended it. We found the theatre emptying, for the opera of "Traviata" had been performed at six o'clock to a crowded house, and as there had been no time for ventilation, the heat and impure atmosphere were overpowering. We endured till 12.30, for the performance was excellent, and we left it still proceeding. The Neapolitans go in for a high old time during the Carnival, and no doubt settle down after it is over in repentance, sackcloth, and ashes.

The streets of Naples abound in interesting sights, and much of the domestic life goes on in the streets in front of the houses. Fireplaces apparently are unknown in many of the houses, and when cooking is to be done, a charcoal brazier is brought outside, wood is lighted on it and kept fanned; when the embers are red hot and the smoke has passed off, it is taken into the house and used for cooking. The cows are taken about with their calves and milked up against the house doors, generally into glass tumblers; the buyer can then use his own judgment as to the quantity of water required.

We saw a priest conveying the Host to a dying man; a canopy was held over him to protect him from the rays of the sun, while lamps were carried, and incense swung, by the attendants. As the procession passed, all employment was, for the minute, suspended; our cabman checked the wild career of his horse and devoutly took off his hat; even well-dressed ladies knelt on the pavement. On the procession passing into the house, the world wagged on as usual.

We must here take leave of gay-hearted, crowded Naples, and visit the long buried city of Pompeii, and after that, sail over the waters of the bay to that delightful island home of artists, Capri.

BLEACHING BROMIDE PRINTS.

BY F. C. BEACH.*

Preparing sketches in lines with black ink for photo-engraving purposes is now so general, that it has seemed to me there is a need, if possible, of using bromide paper as an aid to the artist for this purpose, since it would save time and be more convenient.

It is well known that if an untoned silver print be inked over in lines, the photographic image may readily be bleached out by pouring on the surface a solution of bichloride of mercury and alcohol; or the print may be floated thereon.

To obtain the best effects by the photo-engraving process, it is required that the original sketches be of large size; hence when a picture is to be reproduced it is necessary first to make a small negative, then a positive by contact, and third, from that, to produce an enlarged negative, from which the silver print is made, over which the artist sketches.

It occurred to me, here was an unnecessary amount of time lost, provided we could utilize the bromide paper, for upon that we might enlarge directly from the original negative to any desired size; then, by sketching over the picture with ink, our object would be attained. But the difficulty that presented itself was the simplest and best way to bleach out the photographic image on the bromide paper, so as to leave a white background between the ink lines.

In looking over several books on photography, I was unable to find a definite formula for this purpose; but recently I read that a picture on bromide paper was made to entirely disappear by the use of ferric chloride.

Acting on this suggestion, I submitted a bromide print, after fixing and washing, to the action of a very strong solution of ferric chloride for many hours, with the result of bleaching it out until it obtained a sandy-brown colour. Beyond this the solution had no further bleaching power.

Using a solution of bichloride of mercury on another print, I was able to whiten it; but the shadows were of too pronounced a brownish-yellow colour to render it of any use.

Recently I have tried a series of experiments which may be of some interest, as showing by what simple means successful results may sometimes be obtained.

I first made an 8 by 10 undertimed bromide print, and, before fixing it in hypo, cut it into four parts. Two of the parts I fixed in a mixed hypo and alum bath; the other parts I left unfixed.

Knowing that a weak solution of ferridcyanide of potassium (commonly termed red prussiate of potash) in hyposulphite of soda was the standard solution advised for reducing negatives, I inferred that if it was made strong enough, it might act as a good bleaching agent by reducing away the picture. Accordingly I prepared the following solution:—

Water	6 ounces
Hyposulphite of soda	480 grains
Ferridcyanide of potassium	240 „

dissolving each in the order named. The solution presented a dark green colour, and kept clear for about an hour, after which it became muddy.

Laying one of the unfixed portions of the bromide print upon a plate of glass, I poured over it the above solution rapidly, and in about a minute all traces of the picture at once disappeared. After washing, looking at it by white light, it was, as I surmised it might be, quite yellow. The next question was to dissolve out the extra silver unacted on by light, and whiten it. So I immersed it in the hypo and alum bath; but this had the reverse effect, for by decomposing the ferric cyanide, the paper rapidly changed to a beautiful prussian blue colour. When the print was dried I afterwards endeavoured to eliminate the blue by immersing in a weak solution of carbonate of soda, but without success.

I then subjected the fixed portion of the print to the same solution for three-quarters of an hour, but was unable to reduce away the picture sufficiently.

The result of this experiment shows that an unfixed bromide image may be immediately bleached out with the above solution, leaving a yellow colour on the surface of the paper. I next made a solution of bromide of copper, as follows:—

Bromide of copper solution	½ ounce
Water	3 ounces

I then submitted an unfixed portion of the bromide print to its action. In the course of three or four minutes the image was transformed to a very light yellow sandy colour. At this stage I dipped my finger in the hypo solution, then touched one corner of the print, and noticed all trace of the picture to disappear at that point very quickly. I then inferred a mixture of hypo with the bromide of copper would effect the same result. In this I was not disappointed, and found the following solution would effectually and easily bleach out either an unfixed or fixed bromide print, in about five minutes' time. Continual movement of the solution over the surface materially helped the bleaching action.

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* Read before the Photographers' Convention at Chicago, Ill.

Bromide of copper solution...	$\frac{1}{2}$ ounce
Hyposulphite of soda	100 grains
Alcohol	1 ounce
Water...	2 ounces

The alcohol is added to prevent the ink from spreading.

I purchased the bromide of copper solution already prepared, but it is very easily made. The following is the usual formula. Make two solutions as follows:—

Bromide of potassium	120 grains
Water	4 ounces
Sulphate of copper ...	120 grains
Water	4 ounces

Mix the two, and we have a bluish bromide of copper solution.

A final experiment was the immersion of a bromide print for long intervals in two successive baths of boiling water.

To my surprise, though the test was severe, no dissolving action took place. By running the finger over the surface of the print, the soft gelatine could be felt, but the picture appeared to be imbedded in the texture of the paper, and did not disappear.

With this paper I submit the specimen sheets or pieces of paper treated in the different ways described for examination. The experiments were made upon Eastman's A paper, developed with ferrous oxalate.

In respect to the finished polished print here submitted, my experience is that one of the best and easiest ways to secure a high polish, is to employ what is known as hand-polished vulcanized rubber sheets, or specially prepared ferrotype plates, and also a paper coated with rather more than the usual amount of gelatine. Too little gelatine will give the surface of the print a mottled half finished appearance, particularly when observed by reflected light. In warm weather the prints will not readily strip from the rubber sheets, unless they are fixed in a combined hypo and alum bath. Before squeegeeing on to the rubber, the surface of the print should be rubbed over with the fingers under water in the tray, to take off any of the milky sediment settling upon it while fixing. If this precaution is not observed, the print when stripped will present a mottled, mealy appearance.

A very simple squeegee is a thick rubber tube about one inch in internal diameter, drawn over a round stick, made somewhat longer than the tube. The print is laid, face downwards, on the rubber, the surplus water on the back being taken off with blotting-paper; the roller squeegee is then rolled over the print, pressing out all air-bells, besides bringing the print in uniform contact with the rubber. When dry, it is readily pulled off from the rubber, having a fine polish. No talc or oil is necessary. I have used these rubber sheets for nearly two years with perfect success, and do not notice that the surface becomes dimmed. For giving a high polish to unmounted silver prints, the polished rubber is unequalled. Simply squeegee the albumen prints while wet on to the rubber the same as the bromides.

In conclusion, I may add that many of our valuable processes are founded on simple experiments carefully carried out. If, then, all those photographers who have the time and inclination would study and experiment, note the result, and freely impart the same to others, how much richer in useful and practical information the entire fraternity would become.

I trust scientific experimentalists in photography will become more numerous in future years, especially in this country, and that a spirit of intercommunication of ideas, and the exchange of the results of practical manipulation, will over-ride all feelings of hesitation, competition, and jealousy.

ON SYSTEMS OF NUMBERING PHOTOGRAPHIC LENSES AND DIAPHRAGMS.

BY O. SMITH.*

As I illustrated the working of the *f* system, so I will now illustrate the uniform system. The Doctor has been asked what exposure is required for U S. No. 22, to which he replies that he intends to give fifteen seconds for U.S. No. 13. "To find the exposure you ought to give," adds the Doctor, "divide twenty-two by thirteen, and multiply by fifteen; the number thus found will be the required exposure in seconds." There is, however, no need for this amount of calculation. If I wanted to know the value of twenty-two yards of cloth I should expect to be told the price per yard, not the price for thirteen yards; and we all know that there can be no simpler way of quoting prices for commercial purposes than this. Yet it does not seem to have occurred to photographers that this simplicity can be applied to their own work—that, as drapers always quote the price of cloth per yard, having in view one idea only—that is, the quality of the cloth—so it is possible for photographers to quote the exposure per unit, that is, in this case per standard number, having also only one idea in view, namely, the actinic power of the light reflected from their object. If this plan of quoting exposures per standard number were adopted, we should have in the uniform system the simplest plan that could be devised.

The simplest, certainly, but not the most accurate. It answers our purpose to put up with a certain amount of inaccuracy for the sake of simplicity, but in some cases the U. S. numbers are so inaccurate as to be quite useless.

You will readily see that these numbers are not really comparative exposure numbers, for the latter, as you know, vary with the square of the image focus, while the U.S. numbers depend on the square of the principal focus. In taking landscape and distant views there is only a very slight difference between the latter and the image focus, so that in these cases the U. S. number may be used as the comparative exposure number. But for indoor work—portraiture, copying, or enlarging—where the image focus varies very considerably from the principal focus, the U. S. numbers are too inaccurate. In these cases, therefore, the photographer must find some other system.

Again, a person working with a set of combination lenses cannot use this method; for what will be U. S. No. 30 with one combination will be U. S. No. 50 with another. Diaphragms are sometimes sold apart from lenses, such, for instance, as those sold with Grimstone's instantaneous shutter. These cannot be numbered by manufacturers in accordance with either the *f* system or the U.S. system.

All these objections may be removed by eliminating from the U. S. number that part of it which depends on the principal focus. The formula for finding the U. S. numbers is

$$P^2 \times \frac{1}{16\ a^2} = \left(\frac{P^2}{16\ a^2}\right),$$

and that for finding comparative exposure numbers is

$$m^2 \times \frac{1}{16\ a^2} = \left(\frac{m^2}{16\ a^2}\right).$$

(P = principal focus, a = the aperture of the diaphragm, and m = the image focus.

Following the suggestion I have just made, our stops will be numbered in accordance with the formula $\frac{1}{16\ a^2}$, so that to find the comparative exposure numbers we must multiply these stop numbers by m^2. On putting this into practice, however, we shall find that these stop numbers will be rather too high for easy use. This difficulty, however, may be overcome by slightly altering our formulæ; thus

$$\frac{m^2}{4} \times \frac{1}{4\ a^2} = \left(\frac{m^2}{16\ a^2}\right),$$

though, as you see, we do not alter the result.

While these formulæ are on the board I may as well show you what sort of numbers they will give. Taking the usual run of stops to be from one-twelfth of an inch in diameter to one and a half inches, and the image focus to extend from 4 inches to 12 inches, the numbers will be, for the lenses from four to thirty-six, and for the diaphragms from thirty-six to one-ninth.

These numbers are not too high to deal with easily. This one $\left(\frac{1}{4\ a^2}\right)$ you will have stamped on your diaphragms; but how about the other? You cannot have it stamped on your lens, for it is constantly altering, and it would be absurd to suggest the practice of measuring the distance between ground glass and lens, and making use of this formula $\left(\frac{m^2}{4}\right)$. The simplest way of getting over this difficulty is certainly by means of a measure such as this one which I will presently pass round. It is marked in such a way that on placing one end against the centre of your lens you will see the value of $\frac{m^2}{4}$ on the tape opposite to the ground glass.

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* Continued from page 509.

This system is technically perfect, and may be applied in every case; a stop marked in accordance with it is correctly numbered, whether used with a six inch combination or a nine inch, whether you are doing landscape work, or enlarging, or copying. I would suggest that all stops be marked in accordance with this formula $\left(\frac{1}{4\,a^2}\right)$ as well as with the U. S. number, so that in taking distant views the photographer may, by using the U. S. numbers, avoid all calculation, and where circumstances do not permit of his using U. S. numbers, then he can use the method which I now recommend, and which I think will be best described as the comparative exposure system.

I have now to speak of the arsa system. The formula for finding the stop number is $\frac{(64a)^2}{10}$, and for the lens number $\frac{(4p)^2}{10}$. This system is not to be condemned on account of the complicated formulæ upon which the numbers depend; but we shall not find the numbers themselves everything that could be desired. Taking the same range of stops and lenses as before, you will find that under the area system the stop numbers will run from 2 up to 920, and the lens numbers from 25 to 230. In presence of such high numbers I do not think it necessary to make any further remarks on this system—we are literally over powered by numbers.

I will draw your attention to a formula, given in connection with this system, for finding the area numbers of any combination when you know the numbers of the separate lenses.

The formula is $\frac{x+y}{8}$, x and y being the area numbers of the separate lenses. This formula is remarkable for its simplicity and its inaccuracy. Take a combination composed of a five-inch and a nine-inch lens—the area number for the combination according to the formula given would be 21, but according to the true formula 16. The fact is, the formula is true in one case only, and that is when the two lenses are of equal focal lengths, and this is a case which you never find in practice, for no combination set has two lenses of the same focus.

Another objection to this system is that it takes standard No. 16 as its unit, and not standard No. 1. And as the lens number depends on the principal focus, it is, in common with the *f* system and the uniform system, inaccurate when the object is at a less distance from the camera than twenty times the focal length of the lens.

Stops are sometimes numbered 1, 2, 4, 6, or, as the case may be, in accordance with the comparative exposure required, calling the largest diaphragm No. 1; but as the size of the largest aperture will vary in different sets of stops, this method depends upon variable units, thus preventing any comparison between one photographer and another, besides rendering difficult the use of tables of exposure such as Mr. Burton's or Mr. Howard Farmer's. This plan is therefore practically useless.

I have now been through my list of systems, and have selected as best the joint use of the U. S. and the comparative exposure systems. It will be useless to mark stops already cut with the formula $\frac{1}{4a^2}$, because the numbers would probably be found to be decimal numbers or numbers too clumsy for easy use; but, of course, diaphragms may be cut so as to give the simplest numbers possible. To show this clearly, as well as to show how the union of systems which I have recommended would work, I have prepared a table similar to No. 3 table in Burton's "Modern Photography." In a slightly extended form this table would be very useful to those manufacturers who might wish to number their stops in accordance with the plan here suggested. The second column shows the exact diameters of all the stops that would be necessary from one-thirteenth of an inch to three inches, the first column shows the number of the drill to be used for cutting these stops, and the third column gives the comparative exposure stop number. This number would be stamped on the diaphragm, and would be correct whatever lens it was used with. The other columns show the U.S. number in just the same way as in Mr. Burton's table.

Suppose that a person wants a set of six stops for a ten-inch focus lens, the full aperture of which is not quite 1½ inches. He will find in the second column the diameter 1·4 as the next stop smaller than 1½ inches; against this diameter he will find on the one side the drill to be used, and on the other, one of the numbers which will be stamped on the diaphragm; further along, under the column headed focal length, 10 is the U.S., number, which also will be stamped on the diaphragm. Then looking up the same column he will see the U.S. numbers ranging up to 400 for various sized stops; he finds against No. 400 that the diameter of this stop would be one-eighth inch, but as he does not want so small a stop, he makes use of the next row—No. 9 drill, comparative exposure stop No. 12, U.S. No. 316. Then having decided upon the largest and smallest stops, he can choose intermediate ones from the list at his pleasure and in a similar manner.

The comparative exposure stop numbers here are preceded by either a multiplication or a division sign; this prevents the possibility of anyone forgetting how these numbers are to be applied to the number on the tape measure, and in the case of the numbers preceded by the division sign it is simpler to write ÷ 6 than $\frac{1}{6}$. It will be seen that the U.S. numbers are in most cases rather high and awkward numbers to deal with, but there is no necessity in practice for extreme accuracy. It will be quite near enough if instead of numbering a stop 7·11 it is numbered 7; 9·68 can be numbered 10, and so on. But the fact of these numbers being odd and high numbers is not really of very much consequence, for you do not have to go through a series of calculations with them in order to arrive at the requisite exposure, as you do in the *f* system. Having in your mind Mr. Burton's or Mr. Howard Farmer's list of exposures for standard number one, you have merely to multiply these by the U.S. number.

Here is a table of area system numbers, taking the same lenses and stops as in the previous table. The top now consists of the principal foci, and immediately beneath these are the lens numbers; in the first column are the drill numbers, and against them the stop numbers. It will be seen that there is but little to choose between this table and the other as regards the character of the numbers, but in the area system you have two numbers to deal with—the one having to be divided by the other. In the uniform system you have the quotients worked out and stamped on your stops, while in the area system you have to work them out yourselves.

In conclusion, I strongly recommend every one, in speaking of exposure required, to give the exposure per unit, that is, per standard No. 1 $\left(\frac{f}{4}\right)$

I would also advise those who have stops marked according to the *f* system to re-number them in accordance with the uniform system. This is done by dividing the *f* number by four and squaring the result. For example, take $\frac{f}{24}$—24 divided by 4=6—$6^2=36$, and this is the U.S. number.

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DEMONSTRATION OF EASTMAN'S AMERICAN FILM.

BY H. J. GIFFORD.*

For the development of these films, I find the soda and potash developer to be the best, though I have seen some negatives developed with ammonia as good as the best developed with soda.

The formula which I find best is the one recommended by Mr. Wollaston at the Convention held last month at Glasgow, viz:—

No. 1.—Sodic sulphite	... ...	8 ounces
Hot distilled water	... ...	40 „

When cold, render slightly acid with citric acid, add 1 ounce of pyro, and filter.

No. 2.—Sodic carbonate (washing soda) pure	...	3 ounces
Potash carbonate, pure	... ...	1 ounce
Water	... ...	40 ounces

Mix equal parts of 1 and 2 for normal exposures. The development must be carried beyond the density usual for glass plates, as you must remember that the paper, which is only translucent, is afterwards removed.

While these are fixing and washing, I shall first prepare the glass on which they are to be placed, and then give you a resumé of the process.

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* A Communication to the Cardiff Amateur Photographic Society, August 12.

The paper is first coated with a layer of soluble gelatine—that is, just ordinary gelatine—and when that is dry it is coated on the top of this gelatine with the emulsion, which is highly chromatised—that is, rendered insoluble by aid of a chromium salt. After development, while the negatives are washing—and they need little washing before stripping, as you must remember that we are going to remove the paper which contains most hypo, and wash the film from the back with hot water—you prepare the glass to receive them by first coating it with a solution of india-rubber in benzol; this is to prevent the collodion from sticking to the glass, and need be only very thin—about one part of rubber to 200 of benzol is quite sufficient. When this is dry, the glass requires a coat of plain collodion on the top of the rubber, which is allowed to set, and then placed in a dish of clean water, and the solvents washed out. You must not allow it to set too much, or you will be troubled by the film leaving the glass before you want it to. When the solvents are all out—that is, when the plate does not appear to be greasy when taken out—it is ready for the film to be "laid" down on it. The plate is put in water, and the film floated over it face downwards, in the same way as in carbon tissue; the two are brought into contact, removed from the water, and squeegeed down hard. The plate, with the film attached, is then placed between dry blotting-paper, and a weight placed on top of it. It is allowed to remain there for about fifteen minutes, when it is ready for stripping. To do this, the plate is plunged in a bath of warm water, about 120-150°, and in about two minutes by rocking the dish gently the paper will float off, when the film ought to be gently brushed with a camel's hair brush, and placed in a bath of cold water. This is the time to intensify or clear if thought necessary.

The next operation is to put on the skin. The plate is placed in a solution of glycerine and water, 1 to 20, the skin submerged in this, and allowed to soak until it is limp, floated over the negative, brought into contact, removed from the bath, and squeegeed down, when it is allowed to dry.

When it is perfectly dry, run a sharp knife round the edge and strip off the india-rubber coating; it may now be removed by rubbing gently with the finger, or a pad of cotton-wool soaked in benzol.

I shall end by giving a few general remarks. Before beginning to develop, read the instructions carefully, and carry them out to the letter. Be in no hurry, but take plenty of time, and think of each step before beginning it. And, lastly, if you make failures, do not blame the film, but your own want of skill; and I am sure, if you carry out the instructions, you will not make failures, but good negatives, and give up glass almost entirely, as I have.

Patent Intelligence.

Applications for Letters Patent.

10,794. **John Edward Thornton**, 3, New Lorne Street, Moss Side, Manchester, for "Improvements in photographic roller slides.—6th August, 1887.

10,799. **Ferdinand Boshardt**, 4 Corporation Street, Manchester, for "Improvements in means employed for obtaining shaded photographic stereotype plates, and in the application of photography to the manufacture of shaded photographs."—(*Jean Cassan*, France.)—6th August, 1887.

10,814. **Henry Joseph Shawcross**, 8, Quality Court, Chancery Lane, London, for "The preparation and treatment of paper, woven or tissue fabrics, glass, or other material for the production of copies of drawings, designs, pictures, photographs, writings, and the like, by the action of light."—6th August, 1887.

Specifications Published.

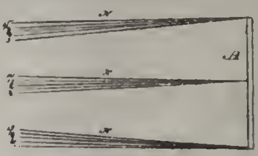
11,615. **Samuel Drew Arundel**, of the firm of Arundel and Marshall, Penn Street Works, Hoxton, in the county of Middlesex, Paper Box Manufacturer, for "Improvements in boxes for holding photographic plates."—Dated 13th September, 1886.

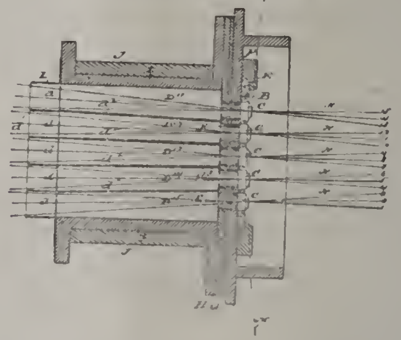
Plate-boxes in which a portion of the ends turns down, so as to render it easy to lift the plates.

Patents Granted in America.

366,225. **Henry Kuhn**, St. Louis, assignor to Henry A. Hyatt, Kirkwood, Mo., for "Photographic apparatus."—Filed Oct. 7, 1885. Serial No. 179,273. (No model.)

Claim.—1. The herein-described photographic apparatus, consisting of the lenses and the light-excluding compartments, the lenses being closely grouped and focused on substantially radial lines, as described, and said compartments being correspondingly arranged, as set forth.





2. The herein-described photographic apparatus, the same consisting of the lenses grouped and radially focussed close together, and the enlarging radially-arranged compartments immediately contiguous with each other, and equal in number to said lenses, substantially as described.

3. In combination with a picture-rest at a fixed distance therefrom, the herein-described photographic apparatus, the same consisting of the lenses grouped and radially focussed, as described, and the enlarging radially arranged compartments immediately contiguous with each other, and equal in number to said lenses, substantially as set forth.

4 A photographic apparatus having the group of radially-focused lenses, and the radially-arranged compartments, immediately contiguous with each other and equal in number to said lenses, leading from the lens-holder, or a backing against the lens-holder, continuously through to or nearly to the point at which the sensitised plate is used, substantially as described.

5. In a photographic apparatus, the combination of the lenses C′ C^2, the lens-holder, and the series of immediately contiguous compartments D′ D^2, adapted to produce a photographic sheet in which the fac-similes are alongside each other, the lenses and compartments being equal in number, the former being radially focussed, and the latter radially arranged as described, and each of the compartments being provided with one of said lenses, substantially as set forth.

6. A photographic apparatus having the lenses C′ C^2, the lens-holder B, and the compartments D′ D^2, said lenses being spaced in one direction farther apart than in the cross-direction, and said compartments enlarging in the direction of the point where the sensitised plate is used, and at the end *d′* being extended in one direction more than the cross-direction, as described.

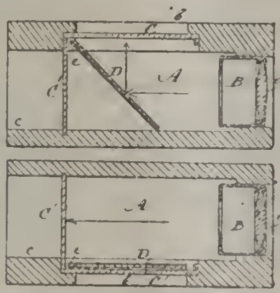
7. The combination, with the lenses, the lens-frame F, the shell I, containing the light-excluding compartments arranged to correspond with the focusing of the lenses, and the veneers G H, arranged with their grains crosswise, and secured to the inner of said compartment-shell, substantially as described.

366,584. **John J. Higgins**, New York, N.Y., for "Finder for photographic cameras."—Filed May 3, 1887. Serial No. 236,916. (No model.)

Claim.—1. In a finder for photographic cameras, a duplex finder distinct from or forming an accessary to the camera, the same being made substantially as described, and comprising a finder-box provided with horizontal and vertical view-apertures, and a movable mirror controlling said apertures as desired.

2. In a photographic finder, the combination, with a finder-box having a horizontal view-aperture and a vertical view-aperture, ground glasses or translucent screens closing both of said apertures, and a movable mirror abapted to restrict the view to either of said screens or glasses, substantially as herein shown and described.

3. In a photographic finder, the combination of a finder-box having a horizontal view-aperture and a rear vertical view-aperture, ground glasses or translucent screens closing both of said apertures, a lens in the forward end of said box, and a movable mirror adapted to restrict the view to either of said screens, as desired, essentially as specified.



4. A reversible finder-box provided with horizontal and vertical view-apertures, ground glasses or translucent screens applied to said apertures, and an adjustable mirror, substantially as specified.

5. A reversible finder-box provided with a lens or lens-opening in front, a rear vertical view-aperture and a horizontal view-aperture, ground glasses or translucent screens applied to said view-apertures, and a self-adjusting mirror controlling said screen, essentially as described.

Correspondence.

AMERICAN AND ENGLISH PHOTOGRAPHERS.

Sir,—What I write about will unfortunately be a very old affair by the time this reaches you, but I ask you to let me have space for a word of explanation. It has reference to the report in your paper of the more than kindly way in which I was entertained by photographers in New York. I am reported to have said—or, rather, the report gives the impression that I stated—of English photographers, that they were more reticent in communicating their experiences to others than were American photographers. Now this is scarcely true, although I found American photographers quite as willing to impart information as English, and I did not say it; or rather let me say I had certainly no intention of saying anything of the kind. I gladly, however, take the blame of any ambiguity on myself. The comparison I drew had regard to non-technical matters—to hospitality, I mean. I do not believe that an American photographer, a total stranger, would be received in England with the overwhelming hospitality with which I was received in New York. The English—particularly Londoners—are, to strangers, probably the least hospitable people in the whole world, with the exception of the Chinese.

Another thing I said—also quite true—was that, contrary to expectation, I had found amongst American photographers much less of what I can only term "bounce," than amongst English. There are one or two English photographers I wot of, concerning whom it might be said that, were a stranger to be conveyed into the society of one of them, to spend a day in that society, and then to go back to his native land, having seen no other photographer, he would return with the conviction that to the individual he had seen was due the credit of every improvement that had ever been made in photography, if not, indeed, the invention of the science itself. Of course, it may only have been due to my brief stay in America that I found no such individuals there. At any rate, I did not find any.—I remain, Sir, yours truly,

Imperial University, Tokio, Japan. W. K. Burton.

THE HYPOCHLORITE REDUCER.

Sir,—In your last issue, page 499, Mr. Ralph W. Robinson refers to hypochlorite and alum as a method of reducing intensity, which succeeds better in his hands than any other, but which he has not previously found described. The identical formula given by Mr. R. W. Robinson may not have been previously published, but the method, hypochlorite with an alum, was described by me in the *British Journal* of September 8th, 1882, together with directions for dissolving away the chloride of silver with hypo.

The alum solution I gave was chrome alum, but the principle involved is identical, and I have used ordinary alum with like success, but scarcely thought the variation worth a fresh publication, unless I had been writing on the subject generally.

When I proposed the use of hypochlorite—for the first time, I believe as a reducer for gelatine negatives there was a very convenient commercial solution to be had, known as Holmes' bleach; and this was the solution I employed. It has been stated in the photographic journals that this solution consisted largely or mainly of hypochlorite of soda, as, indeed, was evident from the published specification. When, for a time, the article went out of manufacture, I used and recommended Labarraque's solution, another hypochlorite solution. I was therefore rather surprised to see in the *British Journal Almanac* for last year an article by Mr. H. P. Robinson, and in your Year-Book of same date an article by Mr. Ralph W. Robinson, each recommending, as a novelty, the use of hypochlorite of lime for reducing intensity, without any reference to the previously published use of hypochlorite of soda. I did not take any notice of it at the time, nor should I have done so now, but for Mr. Ralph W. Robinson's statement in your last issue. I presume that he cannot have been aware of the prior publication on my part.—Yours, W. E. Debenham.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting took place on the 11th inst., A. Haddon in the chair.

S. G. B. Wollaston showed a series of photographic views, principally in the neighbourhood of Dover, many of which had been produced with stripping films.

W. England also exhibited a number of photographs taken with a fixed-focus camera, attached to his tricycle.

A conversation respecting view finders then took place, several plans well known were mentioned, and it was arranged to devote a special evening to the subject shortly.

The practical limit to which small stops may be used in lenses was, to an extent, exemplified by the exhibition of a diaphragm drilled with a needle, whereby it was stated that the image produced was much less sharp than when a large aperture was employed. This naturally led to a discussion on dispersion, and loss by diffraction owing to the rays impinging on the sides of a tube instead of passing through as in a well-constructed pinhole.

W. H. Harrison enquired whether anyone had succeeded in producing satisfactory lantern slides from paper negatives.

F. A. Bridge had some made by Mr. England for one of the South London lantern exhibitions. They showed hardly a trace of grain in the shadows.

Birkenhead Photographic Association.

The ordinary meeting was held in the Free Public Library on the 11th inst., J. A. Forrest in the chair.

The Secretary exhibited a number of Muybridge's latest specimens of instantaneous photography, representing horses taken at racing speed, male and female figures, draped and nude, running, walking, jumping, &c. The action of the limbs as shown by the photographs quite upsets one's preconceived ideas of how they should be placed, and they are therefore of especial value to artists endowed with sufficient courage to depart from the conventional mode of depicting animals and figures in motion. Each plate had from twenty-four to thirty-six representations of the same figure, rendering it a simple matter to follow out the complete action of the limbs in running, jumping, &c., as the case might be; this is especially so when observed through the zoetrope, the figures and animals having then all the reality of life. Some thirty-six cameras are necessary to make a complete series—that is, twelve of each of the three positions depicted, namely, front, back, and side views. The exposures are stated to have been the one-eight-hundredth part of a second; yet, rapid as this is, a wonderful amount of detail has been secured, speaking well for the actinism of the light in America, the same in England probably only giving a silhouette of the subject. To avoid vibration, the shutters are said to be quite detached from the cameras, and are fired by the object breaking fine threads across its path. Those interested in instantaneous work will shortly have an opportunity of hearing all about it *in extenso*, Mr. Muybridge being shortly expected in England.

A Buttonhole Camera was also exhibited, and a developed plate with the six views it is capable of taking without being changed. They showed good definition, and rapidly moving objects were quite sharp. There being no swing-back arrangement, the camera requires to be held quite perpendicular, or the lines of buildings, &c., will not be rectilinear.

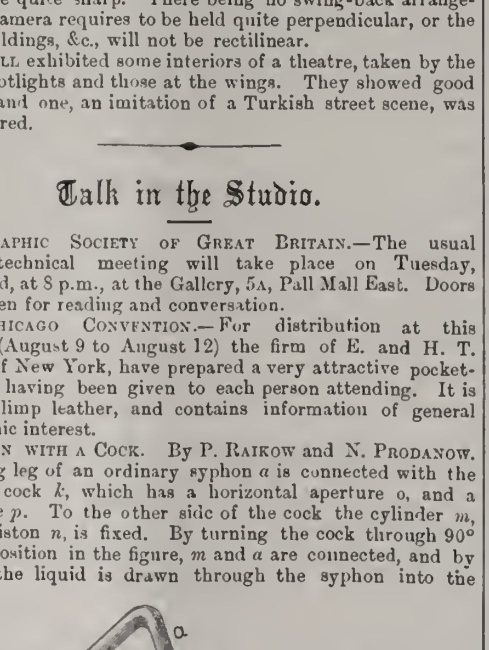
E. NEWALL exhibited some interiors of a theatre, taken by the ordinary footlights and those at the wings. They showed good definition, and one, an imitation of a Turkish street scene, was much admired.

Talk in the Studio.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The usual monthly technical meeting will take place on Tuesday, August 23rd, at 8 p.m., at the Gallery, 5A, Pall Mall East. Doors open at seven for reading and conversation.

THE CHICAGO CONVENTION.—For distribution at this gathering (August 9 to August 12) the firm of E. and H. T. Anthony, of New York, have prepared a very attractive pocket-book, one having been given to each person attending. It is bound in limp leather, and contains information of general photographic interest.

A SYPHON WITH A COCK. By P. RAIKOW and N. PRODANOW.—The long leg of an ordinary syphon *a* is connected with the three-way cock *k*, which has a horizontal aperture o, and a vertical one *p*. To the other side of the cock the cylinder *m*, with the piston *n*, is fixed. By turning the cock through 90° from the position in the figure, *m* and *a* are connected, and by raising *n*, the liquid is drawn through the syphon into the cylinder *m*. If, now, the cock be turned to its original position, *m* is shut off, and the liquid runs out through *p*. To stop the flow, the cock is turned through 45°, and thus the liquid can be run off as required. If the cylinder *m* be graduated, the volume of liquid run off can be readily measured by first drawing the liquid into *m* by raising the piston, and then connecting *p* and *m*, thereby closing the connection with *a*.—*Journal of the Society of Chemical Industry*.



THE INDISPENSABLE BICYLISTS' HANDBOOK.—A new issue of this useful annual, published by Iliffe and Son, of 98, Fleet Street, at 2s. 6d., has just been issued; and now that many photographic tourists use the bicycle in preference to the tricycle for taking out the camera, we may put it that every photographer should know what is being done in the bicycle world. The feature of the year is the wide-spread use of the small-wheeled bicycle geared for speed; machines of this kind being specially adapted for taking of the photographic requisites. All interested in cycling and photography should obtain this handbook. Indeed, to say it is edited by Henry Sturmey is sufficient.

DR. JUST'S HANDBOOK OF SILVER PRINTING.—Under the title of Rathgeber fuer den Positivprocess," Dr. Just, of Vienna, has issued a useful handbook, which not only deals at length with the process of printing on albumenised paper, but also includes platinotype (the process—not merely how to use commercial platinotype paper) and many other useful matters.

PHOTOGRAPHIC CLUB.—The subject for discussion on August 24th will be "The Production of Transparencies." Saturday outing at West Drayton; train, Bishop's Road, at 2.8.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

C. BASTIAN.—Leave it far longer in the bichromate bath, as unless the solution equally penetrates all parts, there will be the mottled appearance you complain of.

MAW.—The American firm in question does not manufacture the articles as stated by their English advertising agent, but the firm buys them ready-made. It cannot, however, be supposed that the gentleman in question wilfully misstated the case. All the other questions should be addressed to the agent.

C. T. (New York).—The periodical containing the paper you refer to came to hand by the same post as your letter, and in the main we agree with what you say; but you are a little too severe.

M. and T. SCOTT.—Thank you for sending us the "photo etching," which we assume to be made by scraping through the film of the enlarged negative with a point, so that the resulting dark lines form cross-hatchings, reproducing on a higher scale the shades of the original photograph. The general effect is excellent, and such portraits are likely to be popular among those who wish to have something different in appearance from a photograph.

A. A.—A *first-class* worker in this direction could probably obtain two or three guineas a week, but those who are only up to a good average find difficulty in obtaining appointments. We will write and give you such further information as we can get.

E. H. B.—Thank you for sending us the paper; it interests us very much.

TONER.—Nothing is quicker than the bath you mention, but other circumstances affecting the rapidity of toning are the hardness of the film and paper, and the condition of the paper and film as regards acidity or alkalinity; the latter being favourable to quick toning. The use of ammonia as you propose would not affect the result much unless the prints remained a long time in the alkaline water—indeed, longer than it is desirable to leave them; and if the ammonia only partially penetrates the film, the toning may be unequal. It would be better to fume in the usual way.

IMPROVER.—The instruction given is very good, and we strongly recommend you to attend the classes.

A. J.—The matter you refer to was probably only retained in the specification on the principle of claiming everything which could possibly bear on the question, and if old, it invalidates the whole of the patent. Under certain conditions, and if unopposed, a patentee may disclaim anything to which he finds he cannot substantiate his claim. It is very unlikely that the company will interfere with your working of the process as you describe it; but, at the same time, we have considerable doubts as to whether it would pay you to work it.

G. R. MAINPRIZE.—The cheap landscape lenses which we have seen of the make referred to, are of the ordinary type with two pieces of glass cemented together; and we have no doubt this is the case with the one that you have. Take the lens out of the setting, and examine the edges.

E. H. MICKLEWOOD.—1. As far as our observation goes, it makes no difference whether the potassium salt or the ammonia salt is used. 2. They can be obtained from Edwards, of Hackney, or from Gotz, of Buckingham Street, Strand. 3. Not very well; at any rate, it is desirable to use them as soon as as you can. 4. When used in daylight, the yellow screen is desirable, but not essential in all cases.

E. C. MASTERS.—You will find the information in the YEAR-BOOK for 1887.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI.—No. 1512.—August 26, 1887.

PATENT OFFICE LIBRARY

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SENDING SPECIMENS ON APPROVAL.

Is the practice of submitting specimens of own work to continue, now that oft-repeated and well founded complaints are made against the system? No doubt many are already favourable to its abolition, and circumstances may induce others to agree with them. The subject has exercised professional photographers for a long time, with the result that a great deal has been written concerning it, in which it has often been shown that the prevailing custom, when resorted to as evidence of ability, brings forth so many disappointments as to render the plan practically useless. Indeed, how can it well be otherwise? An employé—be he operator, retoucher, or printer—cannot justly claim to be the sole producer of a photograph, any more than a man who mounts and sells a lens of foreign manufacture is entitled to rank as an optician. Only a share of the total skill employed can be admitted, and under some conditions the actual proportion may be quite insignificant. Then, again, there is something to be said regarding the conditions under which exceptionally good work has been produced; whether an applicant for a vacancy is able, under altered circumstances, to display equal skill, is a problem which can only be decided by actual trial. It is in this crucial test that the employer sometimes finds out the disadvantages of the arrangement, and desires that it be superseded.

There is, however, another element in the question which, owing to the evil effects frequently produced upon photographers' assistants—who, with very few exceptions, are intelligent, trustworthy, and hard-working—claims immediate attention. It is the unfeeling, dishonest, and very disgraceful trick of retaining specimens sent in reply to advertisements. Viewed from any standpoint, such a proceeding is highly immoral, and in the end will, it may be wished, meet with its proper deserts. Our business, however, is with the present rather than the ultimate aspect of the case; and to consider the mischief that will, in many instances, happen to the unfortunate assistants who have been robbed. In "Answers to Correspondents," page 480, "J. P. M." has evidently fallen into a trap of the kind, and "J. P. M." is by no means alone in experiencing the loss of samples—for the time being, his stock in trade; several times we have known of good work having been forwarded to advertisers situated at considerable distances by assistants who were seeking employment, but these examples were not returned, neither was any reply vouchsafed after repeated communications respecting the detention of the specimens. Circumstances of this nature are likely to produce great hardship, and ought to be provided against as far as possible, for who can estimate the extent of suffering which may have to be endured mainly through no other cause than that of enforced idleness, which, unfortunately, is in a large measure induced by the means above referred to? Until a general agreement has been arrived at to ignore altogether the plan of selecting an assistant who shall happen to have forwarded the most novel styles of work for approval, but not necessarily the best specimens of technical excellence, the difficulties constantly complained of will continue.

One assistant related that he sent quite a number of specimens in reply to an advertisement, which resulted in an engagement; but when the term agreed upon was near expiry, and his stock of specimens had lost their freshness and were out of date, his employer positively refused to allow any of his photographs to be used in a similar manner; furthermore, he threatened his employé that should it come to his knowledge that the assistant had selected a few prints from among those which he had assisted in producing, he would answer for so doing in a court of justice. In such a case, what is the employé to do? He must not steal prints, or legal proceedings are promised; besides which, stolen specimens are again stolen from the assistant to adorn another photographer's show-cases in some out-of-the-way locality—perhaps attached to a travelling circus—and it becomes a matter of considerable difficulty to recover possession of such, even when assisted by the police authorities located in the districts. It might, by the way, be mentioned that the police are almost powerless to act in cases of this kind without duplicate copies of the missing photographs have been supplied to them for comparison with those exhibited in places they suspect. To comply with this condition is often a difficult matter for an assistant to do, and it usually happens, therefore, that he is left no alternative but that of meekly submitting to be defrauded.

There would be no difficulty in typifying any number of instances, both from an employer's point of view, and that of the assistant's, wherein it could easily be shown that specimens are very little use at any time, and the disadvantages far outnumber the proportion of advantages which can by any possibility be claimed for a continuance thereof; but we have no doubt that a discussion upon this subject at the present time would elicit much useful information, and pave the way to a general understanding among all classes of professional photographers as to the desirability, or otherwise, of permitting a circulation—albeit a circumscribed one—of portraits entrusted to their keeping, and which they have no right morally to allow out of their possession without express sanction obtained previously from the client. Perhaps "Criticus" will throw out a suggestion in "Business Management" how to deal with the specimen nuisance; for it is one of those subjects which from its connection with commercial undertakings falls outside the pale of Photographic Society activity, but may perhaps come within the scope of the Convention.

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.*

IV.—Copying Book Illustrations.

Lantern slides are frequently made from book illustrations, chiefly to illustrate scientific lectures, and when made from really good engravings, are very satisfactory. It is often difficult, when one is desirous of making slides to illustrate any particular subject, to find books containing engravings suitable for copying. To copy bad engravings is only waste of time, temper, and money, for slides made from them are utterly useless.

The woodcuts found in most modern books are usually too coarse and rough for making lantern slides, while those in old books, being more carefully executed, and more delicately drawn, often leave nothing to be desired. Engravings on steel, copper, or stone, make beautiful slides, and good ones come out on the screen almost as well as photographs. Still, in selecting steel engravings for copying, all those made in a sketchy style should be avoided, and only those in which the artist has honestly drawn all necessary detail, be chosen.

French books generally are illustrated in a far better style than English ones, and French scientific books will usually afford plenty of good subjects for illustrating scientific lectures, the cuts being boldly and sharply drawn. The well-known works "Ganot's Physics," and "Deschanel's Natural Philosophy," are good types of French scientific books. English scientific books with really good illustrations are somewhat scarce, unfortunately, and also high-priced. "Nicholson's Palæontology," and the beautiful volumes issued periodically by the Palæontological Society, are excellent examples of books with pictures sharp enough for lantern use.

There is a prejudice amongst some persons against coloured illustrations as subjects for lantern slides; but coloured pictures, if sharply drawn, are as good for copying as those that are uncoloured. They will generally require a much longer exposure than plain engravings, but otherwise give results in nowise differing from those given by uncoloured illustrations. As examples, we may mention the coloured illustrations in "Jardine's Naturalists' Library," all of which make first-class lantern slides, as do those in Morris's "British Birds," and the "Transactions of the Zoological Society." The plates in Couch's "British Fishes" do not belong to the same class. In these, the effect is produced by colour rather than by engraving; they are more *paintings* of fishes than coloured engravings, and although some of them photograph very satisfactorily, others come out very patchy, showing spots and brushmarks which are not visible to the eye in the coloured picture.

Copying book illustrations is somewhat laborious work, if carried out on an ordinary table by the aid of a few books as supports for the camera and the volume to be copied from, and yet complicated and expensive copying apparatus is unnecessary.

The first requisite is to have a "long-focus" camera, preferably one of those mentioned above, specially made for lantern work, as not only is a long-focus lens at times useful in copying, but sometimes an illustration may require to be enlarged to fill the 3-inch circle, and it is impossible to do this always with a short camera.

The camera must be firmly fixed to some steady support, or it is liable to be displaced in substituting the dark slide for the focussing screen, or in drawing out the shutter, and the picture will be thrown off the plate. This is no uncommon accident in copying with a loose camera, and it is most mortifying to find, on developing the negative, that the focussing and exposure are exactly right, but owing to a slight touch—perhaps of which the operator has been unconscious—the camera has been displaced, and only a fragment of the picture is on the plate.

If it be inconvenient to make, or have made, a long bench, with a sliding easel, capable of rising and falling at one end, to support the book, and a miniature studio-camera-stand at the other, the following arrangement will, although simple, answer very well. Procure a long board, say 6 ft. to 8 ft. long, and 1 ft. broad, planed well, and not warped; at one end fix another board, about 18 in. by 12 in. by its smaller diameter at right angles to the long board. This will serve as a rest or support for the page to be copied. Along each edge of the long board screw thin strips of wood to serve as guides, between which may slide a board of sufficient diameter to slide easily along, and a little longer than the baseboard of the camera in use. This "secondary baseboard" should be thick enough to allow of counter-sinking the camera-screw. On the middle of this board let the camera be screwed, taking care that the sides of the baseboard are perfectly parallel with those of the secondary baseboard. Blocks of wood, or short pieces of board, of different thickness, will do as supports for the book when it is necessary to raise it to the requisite height.

Then comes the question, how is the book to be kept open? This is always a difficult matter to effect in a satisfactory manner. In some cases metal clips, and in others thin elastic bands, answer best. With many books another difficulty will be found in keeping the page perfectly flat; and this is frequently the case with old books which have been kept shut up for years, and have their leaves puckered and wrinkled in a most annoying manner. When the leaf is not flat it is impossible to get a good focus: either the centre or the edges will be indistinct, often leading the novice to blame his lens for not having a flat field. When this is the case a sheet of thin glass, perfectly free from scratches, bubbles, and other defects, should be placed over the page, and pressed tight to its surface with clips. Unless the picture be perfectly flat, and parallel with the focussing screen, a correct and sharp negative cannot be expected.

The size of the picture is determined by the distance the lens is from the picture. If the picture have to be reduced, the camera is further off, and less expanded; if enlarged, the camera is nearer the book, and more expanded. Hence, copying pictures that vary much in size entails a good deal of troublesome work in shifting the camera backwards and forwards. To ensure getting a negative of exactly the correct size, if a camera larger than 3 in. by 3 in. be employed for copying, the ground glass should have a 3 inch square strongly marked on it in pencil.

The light should not fall on the book from one side, or one side of the negative will be denser than the other; and if the illustration be on rough paper, the grain of the paper will show out unpleasantly. It is therefore best, even at the expense of a longer exposure, to place the apparatus so that the light shall fall on the book from the front, and thus illuminate the whole of the page equally.

After the picture has been correctly centred and focussed, using the full aperture of the lens for this purpose, in order to get the advantage of plenty of light for the work, a small stop should be inserted, even in winter time; for the prolonged exposure necessitated thereby will be amply repaid by the superior sharpness of the resulting negative. In photographing a landscape for a picture on albumen paper, the use of a very small stop is not always to be recommended, as the largest stop that will render a generally correct focus gives more of idea of atmosphere and life to the picture; but in lantern slides we must have absolute sharpness everywhere, or the slide is of little or no value; it may look well enough in the hand, to the unassisted eye, but when magnified on the screen, will be hazy and indistinct.

The exposures necessary will vary according to the light at command, and the time of year. If the apparatus be arranged before a large window, the exposure need not be protracted inconveniently; but for most pictures it is best to give a full exposure, and use a moderately weak developer.

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* Continued from page 392.

Outline subjects—such as the copies of classical figures in mythological dictionaries, and dictionaries of antiquities, copies of old English tapestries, &c., must have as short an exposure as possible; over-exposure will fill up the lines, and give negatives too weak for making good prints. The same remark applies equally to chemical, geological, and botanical diagrams, where there is outline only, with perhaps a little letter-press. In the negative every line and letter should stand out perfectly clean and distinct—*bare glass*, as it is termed; there ought not to be the least deposit or stain on the lines; if there be, the negative must be rejected.

Little need be said concerning the development of the negatives, but in all cases the negative must be fully developed and strong. Any good standard developer will answer, if the operator be familiar with its peculiarities. If a large number of negatives have to be developed in a short time, the potash or soda developers will be found preferable to those in which ammonia is the alkali employed, partly on account of their freedom from irritating fumes, and also because, if properly made up and properly used, they give negatives quite free from stain. A good developer for this work is the potash developer of Beach, particulars of which may be found in the Year-Book of Photography; a good soda developer will be noticed later on, in treating of the development of lantern slides. After development the negative must be *well* washed, and placed in a *clean*, *fresh* alum bath for five or ten minutes. For this purpose, a grooved porcelain dish, capable of holding a dozen negatives in a small space, such as that sold by Mason of Glasgow, will be found much more convenient than the usual flat dishes. After fixing, the negative should be washed thoroughly, and again placed in a fresh alum bath. After this, it should receive another washing, and be reared up to dry. If these details be carefully carried out, the finished negative will be clean and bright, and of a good black and white colour, whether soda or potash developers be used. It is only through some carelessness on the part of the operator that the soda developer ever gives ugly-looking yellow negatives.

This may be a fitting place to notice the process of making lantern transparencies from negatives larger than quarter-plate size, a simple process, but one requiring much care.

One method is to arrange a long board in front of a window, in such a way as to be capable of being tilted to any required angle towards the sky, and quite clear of buildings, trees, or any other obstructions in front of the window. At the window-end of the board fix the larger camera with focussing screen next the window, remove the rising front, and place the negative to be copied in the dark slide, with the shutter or shutters drawn up. See that the negative is illuminated equally with diffused light, not *direct* sunlight—a window with a north aspect is best. Next place a smaller camera, a long focus quarter plate, or 3¼ in. square camera, at a suitable distance from the larger one, and support it at the requisite height by wooden blocks. Push the smaller camera backwards or forwards, until the negative just fills a three-inch square on the focussing screen, and secure a sharp focus. Some operators prefer to place a stick or narrow board, extending from one camera to the other, to serve as a support for a black cloth, which is then thrown over the apparatus to keep out side-light. When the negative has been correctly centred and focussed, the exposure is made.

Another mode is to dispense with the larger camera, and fix the negative to a frame attached to one end of a board. Rest this end of the board on the window-ledge, and have a smaller camera, either attached to what we have called a "secondary base-board," sliding between guides, or let the camera be attached directly to the long board by its screw, which works in a slot, extending nearly the whole length of the board.

For this work either lenses of the rapid or portable symmetrical type will answer well, or even single lenses, if good, and of not too short a focus. A single lens of seven or eight inches focal length will give excellent results on quarter or lantern plates, should the length of the camera permit of such a lens being used; but do not use a *portrait lens* of any size or make. Portrait lenses give an image far too curved, unless stopped down to a very small aperture; and even then, some portrait lenses will not give a picture sufficiently sharp for lantern use. Portrait lenses have only one good feature, extreme rapidity; this exists only when they are used with a very large aperture, and is not a quality necessary in making lantern pictures.

Gelatino-chloride plates *may* be used in making lantern transparencies from large negatives, and have their advocates; but gelatino-bromide plates, which are now especially made for transparencies by two or three of the best makers, have been brought to such perfection, and have so many qualities to recommend them, that the writer, after considerable experience of these plates, unhesitatingly advises their use in preference to gelatino-chloride, more especially if the operator's time be limited, and a large amount of work have to be got through.

V.—Plates for Lantern Slides.

Amongst some persons there is a strong prejudice against lantern slides made on gelatine plates, and especially those made on gelatino-bromide plates. How this prejudice has arisen is, in many cases, difficult to account for. In some instances, old and expert adherents to wet collodion, familiar with their own process, and certain of always producing the best results, judging of gelatine positives, perhaps from their own failures, perhaps from the imperfect results gained by inexperienced amateurs, condemn gelatine plates as unfit for lantern work; or, amateurs essaying to make lantern slides on the same plates that give them good negatives, and finding the sensitiveness of such plates too great for the purpose, giving only flat or veiled images, compare their results with the lantern slides of some good maker, and thereupon proclaim that gelatine plates are useless for making lantern slides.

During the last two or three years the introduction of good commercial gelatino-chloride plates has done much to render the gelatine process a popular one for making lantern slides, more especially with amateurs. There seems no likelihood, at present, of any gelatine process being adopted by such large slide manufacturers as York and Son, who annually turn out some 70,000 slides of the highest excellence; for wet collodion, when worked on the large scale, presents so many advantages over gelatine, that it promises to hold its own for a long time—the only rival being the Woodburytype process—perhaps the most perfect of all processes for the production of lantern transparencies, but demanding a large amount of experience and manipulative skill on the part of the operator.

Gelatino-chloride plates have many good features to recommend their use to the amateur. They have considerable latitude in exposure, and give a pleasing variety of tones, according to the exposure, the strength of the developer, and the kind of developer used. Some makes have the disadvantage of keeping badly, and they all have the great disadvantage of extreme slowness—a most annoying quality if used for the production of transparencies by copying from large negatives. If used for printing positives by contact, this disadvantage may be surmounted by exposing a number of plates at one time, and here their lack of sensitiveness becomes an advantage, as they may be handled by weak gaslight without running the risk of fogging.

Gelatino-bromide plates, made especially for the production of transparencies, are now issued by two or three good makers. These plates are much slower than even the ordinary landscape plates sold by the same makers, and are as easy of manipulation, either with pyro or iron developers, as gelatino-chloride plates. They give, under proper treatment, transparencies of the highest class, and although not capable of rendering all the varieties of tone of which chloride plates are capable, can be produced either of a fine engraving-black, or of a warm brown, according to the developer and exposure. They are perfectly free from all traces of veil or fog, and good transparencies on these plates have been more than once mistaken by lantern experts, both when shown on the screen, and held in the hand, for fine wet-collodion slides.

Prejudice, however, goes far; an old wet collodion worker, when shown a series of slides illustrating natural history, and made on gelatino-bromide plates, was at first loud in his praise of their excellence and beauty; but as soon as he learned they were gelatino-bromide transparencies, he at once modified his tone, "Yes, they are wonderful for gelatine, but you can't get the strong black-and-white of wet collodion!" The slides had *purposely* been produced of a *warm brown*, as this colour was thought more suitable for animal subjects.

It is hardly worth while for the amateur to make his own bromide or chloride plates, as such work demands conveniences not usually met with in ordinary houses, as well as the possession of a properly constructed drying box; and the commercial plates are now brought to such perfection as to leave little to be desired. Experts in emulsion making and the production of lantern slides will not require to study these chapters, which are intended chiefly for the benefit of persons, perhaps entirely ignorant of photographic work, who wish to acquire facility in making lantern slides, either for the purpose of amusement or instruction.

(*To be continued.*)

CYCLING AND PHOTOGRAPHY.

BY HENRY STURMEY.

When considering the treatment of this subject, I was at first undecided whether to treat of photography in connection with cycling, or cycling in connection with photography, for although it may seem at first sight to be but the same thing, the method of treatment must, in each case, be different, though, doubtless, the same results would be arrived at. Insomuch, however, as my remarks will be read by photographers, I have decided to treat the subject as "cycling in connection with photography," taking it for granted that the individual addressed is already a photographer and possessed of some kind of apparatus, and that therefore any reference of mine to photographic apparatus of any particular make or size will require no explanation to the readers here addressed. This being so, we have to consider in what way photographers would gain by the adoption of cycling in conjunction with their favourite pastime. The difficulty of impressing upon anyone the fact that cycling is a practical pursuit, and that there is an advantage gained by the use of a machine, is, in the year of Victoria's Jubilee, minimised to the extreme, and we may take it for granted by readers of the Photographic News that the advantage to be gained by the conjunction of the pastimes or the use of the two machines—the camera and the cycle—is positive. Briefly speaking, however, it will be apparent to the most casual observer who has ever taken a photographic trip into the country that the use of wheels of any kind would very materially assist his operations. We all know the pleasures of working large plates in the field, and the fine pictures one is frequently enabled to obtain; but those of us who have tried the experiment have also experienced the reverse side of the picture—I do not mean the back of the negative, although we have looked at that frequently enough—when, after a long day's trip, we return with our feather-weight load of fifteen by twelve's, &c., &c., upon our aching shoulders. The expedient of hiring a horse and vehicle of some description is frequently resorted to by those who "go in" for large pictures, and I think no one will deny that it is very much easier, and really more enjoyable, to work with a carriage as the base of operations than without one. Such a method, however, is expensive, and although, when at a photographic exhibition some time since, I ventured mildly to remark to the exhibitor of a twenty-four by thirty-six camera, that "it would be rather expensive work if you did much with it," I was immediately floored by the lordly and contemptuous remark that "amateur photographers do not mind expense." I am, nevertheless, from a personal intercourse with other users of the lens, inclined to the opinion that *that* exhibitor was wrong, and that he had made up his mind if he could not sell the camera, he would have a good try to sell *me*. Well, as I said, it is all very well to ride in a carriage drawn by a horse, but as we all cannot afford it, we must look around for the best substitute we can find, and here the cycle at once occurs to us. True, we have to work it ourselves, and practical riders will tell us it is harder work when much luggage is carried upon a machine; but then, the photographer burdened with his kit is not, as a rule, bent upon a "scorching" expedition. He cares not for cutting records over certain pieces of ground, unless that ground is wholly devoid of the picturesque. He would rather traverse at a steady six or eight miles pace the wooded roads of our midland counties, and, with eye ever on the alert for a picturesque "bit," be ready to unlimber and take a "shot" as opportunity presents. This he can do well with the cycle, and although the novice at cycling would find the work less easy than one who has had experience, I can safely say that more real pleasure can be obtained and more ground covered with the cycle, than by any other means of progression. Few photographers, I think, would care to tramp with anything like a large apparatus above five or ten miles, whilst twenty to twenty-five miles will be the limit of a drive as a rule; with the cycle, however, I have no hesitation in saying that thirty to forty miles for a day's work—unless, of course, the objects of interest were all gathered together in one spot—would be by no means an out-of-the way performance.

Taking all this, then, for granted, that we shall obtain a distinct gain to ourselves in our pursuit of photography by the use of a cycle of some sort, our next inquiry is, "What kind of machine shall we purchase, and how shall we carry our kit?" As everyone living in civilised England is aware, there are various kinds of machines. There is the Bicycle tall and graceful; the Safety, low, safe, and speedy; the Tricycle of various designs; the Tandem and the Sociable, though the latter is a *rara avis* nowadays. In considering which of these varieties of the self-propelled vehicle will be most suitable for our individual purpose, we must first take into consideration the size of the plates we are desirous of working with, for it will be apparent to everyone that it would be rather an unnecessary expenditure to invest in a tandem for the purpose of carrying a quarter-plate about, whilst to think of working a twelve by ten or fifteen by twelve with a bicycle, would be even more absurd. Commencing with the smaller sizes, I would observe that quarter-plates and five by four apparatus and even half-plates—though the latter get cumbersome—may be carried well upon a bicycle. Beyond this size it will be best to adopt a three-wheeler of some kind or other. Of course there is another consideration when talking about a bicycle: you have to learn to ride it. This to the young will be but a matter of small moment, and even to the middle-aged the safety will present few terrors.

Now as to what machine shall be purchased. If a bicycle is selected, I need not here descant, for bicycles and safeties, each in their own class, bear so great a family resemblance one to another that, so long as a good machine is purchased, there is very little to choose between them; and by a visit to Holborn Viaduct the purchaser can be sure of investing in a reliable and serviceable article. Having bought the machine, and mastered its manners and ways, the next proceeding is to attach our apparatus to it. If a pocket detective apparatus be used, why of course it goes into the pocket, the camera on one side and the double backs on the other; and the rider is, like Johnny Gilpin, apparently "carrying weight," though not for the same ostensible purpose. The great bugbear to bicyclists is undoubtedly the conveyance of the tripod; but this can easily be placed upon the handle-bar. It is more difficult of attachment on the ordinary bicycle than upon the safety, for the usual shape of the handle-bars of the latter machine—the ends being bent back, forming a sloping shelf—permits of the very easy attachment of such a piece of apparatus. The rest of the kit may be carried easily. If not too heavy, it may be found most advantageous to make a knapsack of it, and I am inclided to think that this is really the handiest method of all. Another method, and a good one, is to divide the apparatus into two portions, carrying the camera in a box in front of the handle-bar, and the plates in their double backs in a "multum," or bag attached to the back of the saddle: this upon machines of the ordinary type. In safeties of the Rover type it will, I think, be best to attach the whole of the weight to the handle-bar and steering-post by means of a frame which can be bought of most manufacturers. The tripod can then either be carried on the handle-bar, where it will rest upon the remainder of the apparatus, or can be attached to the side of the frame of the machine. If we go beyond half-plate size we must, for comfort and safety sake, take to a tricycle, and here we have many varieties open to us. For the medium sizes and plates—say, up to 10 by 8—almost any good make of machine will do. The most popular type of the present day is that known as the "cripper," or direct steerer, in which all the wheels are fairly large, and the machine is steered with a wheel in front placed in a pair of forks, and worked something like that of a bicycle. The old rear-steering type of machine had many advantages for carrying luggage, but so many drawbacks in other ways that it has gone out of favour entirely, and I should advise all photographers to let it alone. Whatever form of tricycle is adopted, with the exception of this rear-steering type, it will most probably have an axle connecting two side wheels with all the gearing placed in front of it. The back of this axle presents a good medium for the conveyance of our traps. As before, the tripod can be placed at the side of the frame or upon the handle-bar, and the apparatus may be carried over the front wheel; but as there is a great deal of vibration to this part of the machine—and vibration, as we know, helps to cause dust, and otherwise damages our plates and apparatus—it will readily be seen that although fairly convenient, this is not the best place in the world in which to carry our kit. Very handy luggage carriers are sold by every cycle house, which, attaching either to the seat-pillar or to the frame, hang over and form a species of bracket at the back of the machine. Upon this our apparatus may well be placed. Here a case containing everything we require can be strapped, and the tripod may be strapped to the case itself, and carried there as well, if not too long. The space available for luggage carrying here is about two feet in length, and the depth and width are dependent mainly upon the will of the owner. It will be as well, however, to take the precaution of under-hanging with straps a very large and weighty kit, as it does photographic apparatus no good to be bumped suddenly down on a stony road when travelling at any speed. The tandem as generally built is not well adapted for carrying luggage, the chief available place being, as a rule, over one of the smaller wheels, where, as I have before said, very considerable vibration exists. I have a vivid recollection of the very near destruction of a friend's camera through carrying it over the back wheel of a Humber tandem. One of the most suitably designed tandem machines for the conveyance of a camera kit is the "Centaur," a machine which was indeed one of the first tandem tricycles to be placed on the market. The riders sit a fair distance apart, and between them is ample space and a strong frame for carrying the goods.

In conjunction with a friend some three years ago, I used one of these machines on a photographic tour in the west of Ireland. We were both photographers, and carried our camera boxes side by side within the square central frame. Our tripods were strapped along the sides of the frame, and our personal belongings, spare plates, and other things were strapped on a shelf below, a few inches from the ground, the whole weight of the apparatus and personal belongings carried being somewhere about eighty pounds. Unfortunately, however, the machine gave way before the completion of our journey, and we had to finish our trip by means of the conventional "jaunting car." Still the arrangements for the carriage of our apparatus were all that could be wished, and the journey was much enjoyed. Of course a tandem takes two riders, but when a photographer is working large plates, he frequently takes an assistant with him. Now he can take his assistant with him on a tandem, and let him do half—or a bit more if he likes—of the work of propulsion. It will be easily seen that plates of a very large size can be carried on such a machine as I have just described; or two photographic friends can carry fair medium plates without inconvenience.

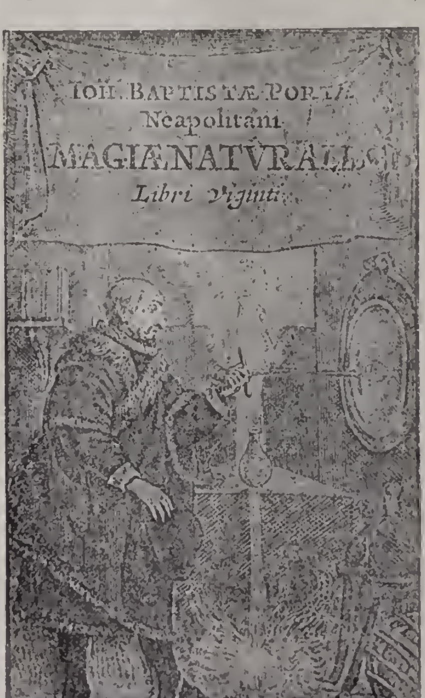
I may here add that the sizes worked upon the trip mentioned were seven and a-half by five, and half plates, respectively. To the professional photographer, however, who works plates of really large size—say fifteen by twelve and upwards—and who desires to save expense in field-working of horse and carriage hire, I can think of no more suitable machine than the "Carrier." There are several Carriers made by different firms, but the first successful machines of this description were built by Messrs. Singer and Co., and they, indeed, are the chief makers of this class of goods. They are supplying some now of a very large size, which will carry a weight of three hundred pounds and upwards, and are propelled by two riders. These are being used by the Parcels Post authorities, and such an one would be well suited for photographic purposes. The machine I now refer to has four wheels, and not three, the riders being placed on each side of the axle of the front pair of wheels. At the back of them, and over the axle of the rear couple of wheels, is a large box measuring something like five feet by three feet six by two feet six, or thereabouts. From this it will be seen that even a wet plate photographer could carry his kit very well on such a machine, and a specially constructed machine for photographic purposes would, I am sure, be of the utmost use. The Carrier could be built to form a dark tent with very little trouble, and in such a tent there would be ample room for working, either for the changing of plates or development of them. Apparatus of any workable size could well be carried without trouble, and the tripod arrangements could strap on at the top of the box, and not be in any way inconvenient. Before leaving this machine, I may mention that a Coventry photographer was one of the first to use the Carrier for photographic purposes, taking one of the first, if not *the* first, built on a trip with fifteen by twelve's round Warwick, Kenilworth, and Stoneleigh. This was a Carrier of the smaller kind, driven by a single rider.

From the brief sketch I have given, it will be apparent that the wants of the photographer in the way of carriage for the rapid, easy, and free conveyance of himself and kit through the country to "fresh fields and pastures new," is met in the fullest degree by the use of the cycle. Photographers, both great and small—I mean with regard to the size of their pictures, and not of their persons—can be accommodated to a nicety, and the expense is no more than that of getting a new lens, if we go in for a good one; whilst this would be saved in the season by the man who spends much in horse hire for photographic purposes, and his own health by the exercise would be decidedly the gainer. In conclusion, I think all will agree with me that no two pastimes could work together more easily and advantageously than cycling and photography.

PORTA; HIS LIFE AND WRITINGS.—II.

BY WM. LANG, JUNR., F.C.S.

In the present article we purpose giving a list of Porta's writings. The first which we have to consider is his "Magiæ Naturalis." This may be reckoned as our author's *magnum opus*, and as in it we find the description of his darkened chamber (camera obscura), and many facts relating to concave mirrors, burning glasses, &c., it will be advisable to devote a special article to a consideration of this work, with its many curious experiments. The oldest edition seems to be one published in Naples in 1558, but this contains only three books; while an edition published in Antwerp in 1560 or 1561 is found with four. The date of issue of the complete twenty books would appear to be 1589, a folio edition, and published at Naples. That the book had an extended circulation we may readily infer when we consider the various reprints that are yet to be found emanating from the various printing centres of Europe. It would occupy too much of the space at our disposal to consider all these in detail, but we may be allowed to refer to an Elzevir in the writer's possession that was published in Amsterdam in 1644. A *fac-simile* of the frontispiece is reproduced herewith, where Porta is shown with a dagger in his hand in front of a concave mirror—an experiment which we shall refer to in detail further on—and known as the mysterious dagger. The quaint nature of the picture is well shown by the figure representing the sun, whose rays, streaming through the open window, and passing through a water lens on the table, are igniting some inflammable material placed on the floor of the apartment. An English translation appeared in the year 1658.



In 1563 we find Porta publishing what might be called a treatise on cypher writing, the title of the work being "De Furtuvis Litterarum Notis Vulgo de Ziferis." In this he indicates one hundred and ninety different methods of secret writing, and shows how these may be still further increased. Later editions of this work appear under the title of "De Occultis Litterarum Notis."

In 1553 or 1558 a work entitled "Phytognomonica" was published in Naples. Herein Porta discourses on the properties of plants, and the means whereby their virtues can be discovered, which he attempts to do by reason of their analogy to the different parts of the bodies of animals. This work was also re-issued at different times.

In 1586, at Sorrento, the first edition of Porta's "De Humana Physiognomonia," libri 4, was published. This work has been translated into both French and Italian, and, curiously enough, a French edition was printed at Paris at so recent a date as 1808. The Italian translation was made by the author himself. The aim of the book is to show the means whereby we may recognize individual character. The woodcuts illustrating the work are of a most amusing character; for instance, we are shown the head of Cesar Vitellius, and alongside is placed an owl, and the head of Plato is in a similar manner contrasted with the head of a hunting dog. Lavater, in his famous treatise on Physiognomy, has adopted to a large extent the ideas put forth by Porta.

"Villie, sive de Agricultura," libri 12, published at Frankfort in 1592, was compiled during Porta's leisure hours. It contains the results of the author's observations in connection with farming, the planting of trees, cultivation of the olive and the vine, &c.

In 1593 was published, at Naples, Porta's "De Refractions Optices," parti libri 9. In this we find dissertations on refraction, on the anatomy of the eye, and on many kindred subjects.

In 1601, also at Naples, "Pneumaticorum libris tres cum duobus libris curvilineorum elementorum," wherein hydraulic engines and their construction are discussed, with a treatise on curvilinear geometry.

At Rome, in 1601, was published "De Celesti Physiognomonia," libri 6, a condemnation of astrology.

In 1602, at Naples, "Ars Reminiscendi," a compendium of all the means practised by the ancients to aid and fortify the memory.

"De Distillatione," Rome, 1608, gives a very good idea of the state of chemistry, or rather alchemy, in the 16th century.

"De Munitione," libri 3, Naples, 1608, a treatise on fortifications.

"De Æris Transmutationibus," libri 4, Naples, 1609, has been reckoned as the first work on a science still very far from being one of the exact sciences, viz., Meteorology.

The foregoing exhaust all Porta's scientific writings; but we have yet to refer to his dramatic works, which will be done as briefly as possible. Fourteen comedies, two tragedies, and one tragic comedy, it seems, emanated from our author. They need not be enumerated. It may be of interest to state, however, that a complete edition of the comedies were published in 4 vols. at Naples in 1726.

Most of his plays were put on the stage, and were for the most part highly successful. That Porta was a man of undoubted ability, and that he rendered great services to the physical and natural sciences—more so, perhaps, than any of his contemporaries—there cannot be a doubt.

PATENT OFFICE LIBRARY

J. B. Porta.

His writings did much towards cultivating a taste for scientific matters, notwithstanding the fact that they are full of vague statements and incorrect observations. To appreciate in full the greatness of the man, we have to take into consideration the age he lived in, and to recollect how superstitions of all kinds at that time abounded. Science was then only beginning to shed its beneficent rays on mankind, and among the many illustrious names who have contributed in their day and generation to lay the foundations on which the science of our own time now rests, that of John Baptista Porta must not be overlooked.

INSTANTANEOUS STUDIES.

No. 11.—The Funny Man.

(*Scene.—Any suburban garden. Amateur photographer endeavouring to pose a group of friends.*)

Amateur Photographer (*reproachfully*).—No larking, please.

Smith.—I say, don't you think it would be an improvement if I stood on my head? (*does so*).

A. P.—No, no. For goodness sake be quiet. You'll make the other fellows laugh, and we shall never get on. I've wasted six plates already through your jokes.

Smith.—My dear fellow, but it is so funny. Whenever I look at Brown, I always feel inclined to go off into a shout.

A. P (*irritably*).—Then don't look at him. (*Smith having been persuaded to resume his normal position, the group is posed once more.*)

Brown.—One moment, please. There's something tickling the back of my neck. I believe it's a beastly earwig.

A. P. (*resignedly*).—Well, look sharp. Don't alter the pose. I was just going to make the exposure.

Brown.—Hang it, Smith, it's too bad. (*Calls out to A. P.*) It wasn't an insect after all; it was Smith with a straw.

Smith.—Ha! ha! ha!

A. P. (*desperate*).—Oh, it's remarkably droll, I dare say; but I don't quite see where the joke comes in.

Smith.—Beg pardon; but really, you know, I couldn't resist the temptation.

A. P. (*taking no notice, but getting the group once more into position*).—Now, then, keep still just for half a second. Now!

Smith (*in an audible whisper*).—I say, Robinson, old man, you've got your hat on the wrong way.

A. P. (*with a sickly smile*).—Thank you, Smith; I wish you hadn't spoken. I'll wager Robinson comes out with two heads.

Smith.—Never mind, old fellow; two heads are better than one, you know.

(*A. P. disappears in his dark room. While developing, he sees Smith "larking" with the camera. In a state of nervous apprehension lest the camera should come to grief, he drops the plate and smashes it.*)

A. P. (*re-appearing*).—It's no good. I told you Smith would spoil it. You've all moved.

Smith.—Let's have a look. I'd give anything to see old Robinson with half-a-dozen heads. (*Goes towards dark room.*)

A. P. (*who doesn't want it to be known that he has smashed the plate*).—Don't go in, Smith; I never allow anybody to enter my dark room.

Smith (*putting his head inside*).—Oh, I say, what a beastly little hole! What have you got in that rum looking box?

A. P. (*just in time to prevent his box of dry plates being opened*).—Now do go out, there's a good chap; I want to put another plate in the dark slide. The light's going fast, and I should like just to have one more shot at you all.

Smith.—Let me come in with you; I should like to see the fun.

A. P.—There's no fun, I assure you. (*Shuts the door.*)

(*Smith, after driving the A. P. wild by making faces at him through the dark-room window, joins the rest.*)

A. P. (*appearing from dark room with slide*).—Just one more attempt, and do pray try and be serious. (*The A. P. makes his last shot.*)

Brown (*looking at negative after it has been brought out by A. P.*).—My goodness, Smith! what's the matter with your mouth?

Smith.—I'm trying to be serious—that's all.

Brown.—But, old man, why did you drag the corners of your mouth down to your chin?

Smith.—Oh, only for a lark. (*Walks away whistling unconcernedly.*)

A. P. (*much vexed*).—It's a pity Smith's so fond of tomfoolery. The portraits of you two are capital, but quite ruined by his unmeaning grimace.

Robinson.—Look here, old man, invite Brown and me some day when Smith's not here.

A. P.—You may depend upon it I'll never attempt photography again when he is by.

Notes.

That the upper part of the wheel of a vehicle in motion is travelling more quickly than the lower part of the same wheel is illustrated very well by a photograph of an omnibus which is sent to us by S. W. Gardner. The exposure has apparently been about half a second, and while the lower ends of the spokes immediately adjacent to the ground are not perceptibly unsharpened by the motion, the tops of the upper spokes show an angular motion corresponding to about ten degrees. The picture is interesting as showing a wheel in such a way as to give a distinct idea of its being in motion.

Relating to our Notes of last week about the photographer by special appointment to the Queen, who advertises his willingness to take a single carte for one-and-sixpence, and whose other prices are correspondingly low, we have received numerous communications, which may, however, be classed under three heads. First, expressions of dissatisfaction at the general lowness of prices; second, complaints as to the system of allowing further discounts to the members of the Stores; third, confident expressions of opinion that low prices do not attract customers to a paying extent.

That the whole matter is one which the Photographers' Convention might well deal with is a general opinion; and, indeed, one can hardly see it as fairly within the province of any other photographic association. In relation to our Note of last week, the photographer to the Queen alluded to, writes:—"You omitted to mention that the prices named were 'Special Jubilee,' as you will perceive by the enclosed list;" but it is difficult to see that this has any bearing on the matter.

A fresh name has just been added to the small list of those entitled to use the title of Photographer to the Queen; the new name being that of G. P. Cartland, of Windsor. Mr. Cartland has from time to time done excellent work for Her Majesty; perhaps one of the most notable examples being a series of pictures of the Queen's dogs—a series for which he received a medal at the late exhibition of the Photographic Society.

When the suggestion was originally made in these columns that the Prince of Wales should be photographed successively in each of the various uniforms and liveries he has a right to wear, and that an album containing the resulting series of princely effigies should be published for the delectation of H.R.H's most loyal admirers, it was not supposed that the Prince's various uniforms—military, naval, civil, or what not—exceeded fifty in number. But, thanks to the enterprising research of a contemporary, we now know that, "taking one consideration with another," our future king, were he to play all the parts upon the world's stage for which he has been cast, would need to make close upon a hundred changes of costume. Of military uniforms alone he possesses enough to clothe a whole company of soldiers; whilst it is a fact, sad or satisfactory according to the way it is looked at, that our future king could go in to dinner for three weeks in succession wearing a different Order of Chivalry on his princely chest.

Curiously enough, the publication of the details concerning the Prince's multitudinous sartorial responsibilities has been well-nigh coeval with the announcement that the Princess Beatrice has taken to amateur photography with all the ardour of a new convert. If, then, H.R.H. can only get her eldest brother to agree to undergo the necessary trouble, there is clearly occupation for her camera for months to come in securing a complete series of negatives of our much be-officed Prince; and the album of assorted princes once filled, a work of reference of great value will be at the disposal of the nation. For instance, the heir-apparent would be able in future to add to the pleasure caused by a visit of his to this borough, or that villa, by allowing his mother's liege subjects to choose (from the aforesaid album) the uniform in which they would most prefer him to make his appearance. Even loyalty might be promoted, too, by the dissemination of "The coming K——" in all his "diverse uniformity," if we may use the term. Those who did not like him in a military dress might be led to admire him in an academical attire; and latent loyal fervour unaroused by the sight of H.R.H. in his robes as a K.G., or his uniform as an Admiral of the Fleet, might be induced by a portrait of our Prince arrayed as a D.C.L. of Oxford Univerity, a Bencher of the Middle Temple, or an Elder Brother of Trinity House! By a judicious shuffling of his assorted *cartes*, H.R.H. ought indeed to be able to score heavily by "honours," if not by "tricks."

The production of a photograph in a divorce case often proves very awkward for the co-respondent. This kind of evidence was, however, in the opinion of the judge, strained a point too far recently, in a case where the photograph produced was that published in a book known to be written by the co-respondent. Whether the photograph in question was a Woodburytype, an Autotype, or by any of the processes akin to the Meisenbach, we are unable to say. Probably it was not direct from the negative, or it would be difficult to see why the judge should object. As the identity was proved in another way, the point was not fully discussed.

The Belgians say that neither Daguerre nor Talbot is entitled to the position which photographic history has assigned them. That honour, according to the *Bulletin de l'Association Belge de Photographie*, belongs to M. Bayard, who has just died at the ripe age of ninety. According to the writer of the paper, Bayard, who was *Chef du Bureau au Ministère des Finances*, made his discovery in 1838, six months before the publication of Talbot's method, specimens being shown at the time to M. Desprez, a member of the Institute, and two months later to MM. Biot and Mayo. On the 24th of June, 1839, at a public exhibition for the benefit of the inhabitants of Martinique, which had been visited by an earthquake, he showed a frame containing thirty proofs. The pictures were the talk of Paris for twenty-four hours, but were forgotten when a short time afterwards Daguerre divulged his discovery and his method. The excitement was general, and, says the writer, "in spite of the report of M. Raoul Rochette to the Academie des Beaux Arts, and inserted in the *Moniteur* of the 13th November, 1839, M. Bayard remained in the shade, and his invention, which never entered the practical stage, was almost entirely ignored." Unhappily for M. Bayard, the writer significantly remarks, he only did his work by halves. He exhibited the image he had produced, but he did not divulge the method.

The *Whitehall Review* devotes an article to the solution of the problem, "Who buys the photographs of actors?" We cannot say that the question is satisfactorily answered, and, indeed, the *Whitehall Review* practically confesses its inability to answer it. Our contemporary remarks that "the photograph of the actor is not the sought-for commodity such as is that of the actress. Still, actors do get photographed, and their photographs are sold. These are, of course, bought by those who collect the pictures of stage celebrities; but the majority of these pictures of male performers fall into the hands of ladies who must be classed under the heading of 'admirers.' The odd part of the thing is that, at the outside, there are not more than half-a-dozen actors—they are popular and good-looking, of course—whose likenesses are to be seen in the shop windows." Upon this text the writer enlarges for a column or so, contending that the actor is admired when he plays a lover's part on the stage, but is not cared for when photographed as he is. This may be so; but what actor is ever photographed save in some part in which he is known? If it be true that only the likenesses of half-a-dozen actors are to be seen in the shop windows, then the market must be a very limited one, and the question, "Who buys the photographs of actors?" is one scarcely worth asking.

Science and Art, a new candidate for the patronage of the art student, has this month an article dealing with phototypographic reproduction. In the future which the writer sees for this process, he enthusiastically depicts its influence upon fiction. "Fiction," he remarks, "which now occupies so much space and attention, can be ably represented. . . . There is at present before the public a serial in which one of the best writers of fiction of the day has painted in glowing and poetic language the heroine of his story. . . . A page is turned, and we come face to face with the artist's rendering of the heroine—or, to be quite accurate, with the engraver's rendering—and away goes poetic fancy of ideal loveliness.' We do not see how the phototype process is to remedy this, unless it is seriously proposed that our novels shall be illustrated by photographs from the life. This would certainly be a novelty, but we have very grave doubts whether the photograph of any young lady would come up to the "glowing and poetic language" which most romance writers indulge in when they write about their heroines. It is pretty certain, however, that the "professional beauty" would take kindly to the idea. It would be so interesting to be pointed out at a "private view," a matinée, or a concert, as the wicked beauty or the persecuted damsel who figured in the pictures in Mr. So-and-So's last novel. By the way, the author of the article we have quoted does not seem to be aware that most artists who illustrate books draw on card, and that the engraver plays no part in the production of the picture.

The *Court Journal* is amazed that Russia should know anything about photography. It remarks: "It is curious that a valuable photographic invention should come from the borders of civilization—Russia. Photographic teaching (*sic*) upon boxwood blocks such as are used in wood engraving has been deemed an impossibility, but——" and then it proceeds to give details of the photo-etching process an account of which appeared in the News a month ago.

The superintendent of the Morgue at New York has been gossiping to a newspaper reporter about the photographs of the identified bodies which have from time to time been brought to the receptacle. Among the more striking cases was that of a swarthy-complexioned man of middle age who had been found dead in the street. The peculiar feature of the photograph was the figure of a Grecian cross indelibly worked in the centre of the forehead over the eyes. Despite this extraordinary mark, he was never identified, and the only clue as to what he might have been was given by a man who some months afterwards, looking over the album, declared he was an Arabian, as in Arabia there are tribes who distinguish themselves by such marks as the man had. Another unidentified case was that of a girl who was found dead in the hall of one of seven houses owned by seven sisters well known in the gay world of New York. Not the slightest clue to her death could ever be discovered, nor did anyone ever appear to claim relationship. Another case of peculiar markings was that of a man on whose breast was a representation of Faith, Hope, and Charity, and underneath a picture of Christ crucified. He died in the hospital, and he, like the rest, had a nameless grave.

It does not, however, follow, because no information reaches the superintendent, that a certain body is not identified. There are sometimes reasons why the name should be concealed, and so long as the friends, relations, or enemies are satisfied that the dead body is really that of the person in whom they are interested, there is an end of the matter. In the case of a woman who died in a hospital, no one appeared to claim her; but some months afterwards, the superintendent was told by a visitor that not only had her husband identified her, but that a friend whom he had brought with him for the purpose had also. The fact was, the woman was drunken and dissolute, and had left her husband, who had married again, thus committing bigamy. The reasons for not identifying the body of the woman were thus sufficiently obvious. If these Morgue photographs could speak, the novelist would have no need to call upon his imagination for dark and tragic scenes in life.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.*

Chapter IX.—Refraction — Refractive Indices — Prisms—Lenses, Converging and Diverging—Focal Points—Chromatic Aberration—Achromatism.

When a ray of light passes from one medium to another of a different density, it is turned from its original path, it is "refracted," unless it impinges perpendicularly upon the surface that bounds the two media. The path of the light in the denser medium forms a smaller angle with the perpendicular to the bounding surface than does its path in the rarer medium, and for the same two media, the sines of these two angles bear a constant proportion to each other. In figure 9, a ray of light is represented by the thick line, the line A B is the sine of the angle of incidence, and the line C D is the sine of the angle of refraction. The proportion between these lines, when the media concerned are air and water, is approximately as 4 to 3, or for air and glass, as 3 to 2. These proportions expressed as fractions are the "refractive indices;" namely, $\frac{4}{3}$ or 1·33, and $\frac{3}{2}$ or 1·5. Refractive indices expressed in this manner are never more than approximate unless the light they refer to is exactly specified, because ordinary white light (or any light that is not homogeneous) is decomposed when it is refracted, the violet and blue being bent more out of the original direction than the yellow, and the yellow more than the red. The appearance which results from separating the constituents of non-homogeneous light is called a "spectrum," and in the spectrum of solar light there are certain dark lines (Fraunhofer lines) which serve as fixed points for convenient reference. Refractive indices for the D line represent as nearly as possible the effect upon the most visible part of ordinary light, and those for G or H (more nearly the latter) may be considered as correct for the average of the chemically active light that is most useful photographically.

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* Continued from page 519.

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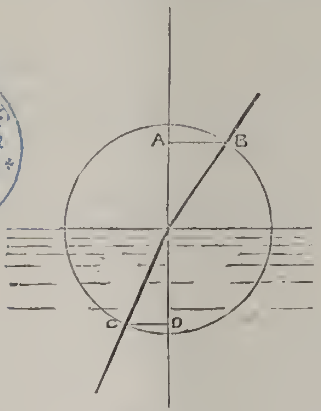

Fig. 9.

If an object is viewed through a plate of glass (or any similar transparent medium), so that the path of the light from the object to the eye is not perpendicular to the surface of the glass, the object will appear laterally displaced, as shown in figure 10, A. It is obvious that the greater the obliquity with which the light impinges upon the surface of the glass, or the thicker the glass, the greater will be the extent of lateral displacement; hence it is possible to correct the distortion of images produced by lenses consequent upon the use of a flat surface to receive the image, by placing a plate of glass between the lens and the receiving surface. This matter will be referred to more particularly in connection with lenses.

If, however, the glass, or other such substance, has plane sides that are not parallel, the rays of light that pass through it will have their direction entirely altered, the refraction at both surfaces taking place according to the rule. The displacement of the image caused by interposing such a medium in the path of the rays is always towards the wider part of the medium, or the base of the triangle formed by continuing the two lines that represent the boundaries of the surfaces until they meet. It should be noted, however, that if an object is viewed *directly* through a dense medium with non-parallel sides, the *apparent* displacement of the object is towards the thinner part of the interposed substance, because we cannot but imagine that the light entering our eyes has come in a straight line.

In figure 10, B, the passage of light through a prism is shown, and the apparent displacement of an object viewed directly is indicated by the broken lines.

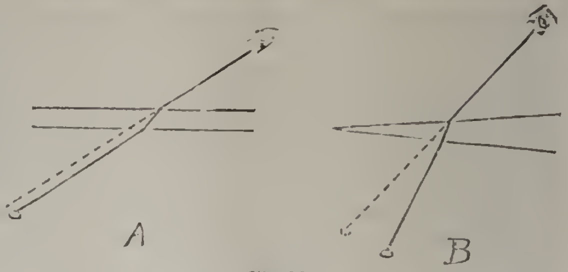

Fig. 10.

If two prisms are placed base to base, light passing through them is concentrated, while if they are placed apex to apex the light is caused to diverge (figure 11). If these two arrangements are made circular, so that the diagrams represent the plane obtained by cutting along any diameter, these two combinations are typical of the two sorts of lenses. The surfaces of lenses are always curved that they may be continuous, and for convenience in manufacture their surfaces are always spherical, although the spherical surface is not what is theoretically required.

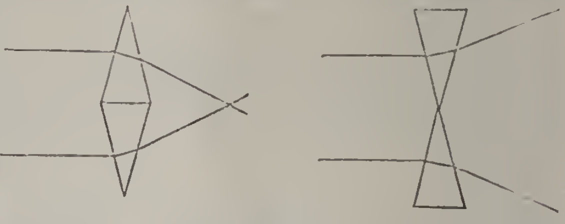

Fig. 11.

There are three forms each of converging and diverging lenses—the double convex, the plano-convex, and the convex meniscus; and the double concave, the plano-concave, and the concave meniscus, each of which is illustrated in figure 12. The last form is sometimes called cavo-convex, but this name is needlessly confusing to the student.

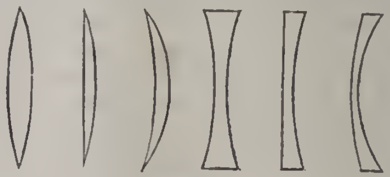

Fig. 12.

Disregarding, for the moment, the spherical and chromatic aberrations that such lenses suffer from, we can sum up the effects that can be produced by their means in a useful and simple way. If a pencil of parallel rays of light is allowed to fall upon the surface of a converging lens the light will be concentrated to a point at a certain distance from the other side of the lens (figure 13). This point is the "focal point," or, more correctly, "the principal focal point," and its distance from the lens is the "focal length" of the lens employed. In this, as in every

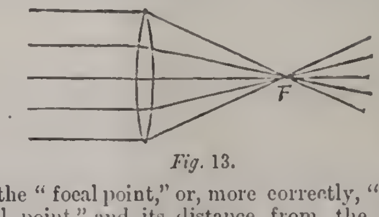

Fig. 13.

other case, the refracting effect of the lens is the same whichever way the light travels through it, so that if a luminous point is brought into the principal focal point of such lens, its diverging rays that impinge upon its surface will be transmitted as a pencil of parallel rays. It does not at all follow from this fact that an unsymmetrical lens (plano-convex, convex meniscus) will produce the same effect with either side toward a luminous object; indeed, if such were the case, it would be contradictory to the previous statement.

If the luminous point is moved further from the lens, the transmitted rays will converge also to a point (figure 14), and when the luminous object is twice as far from the lens as the principal focal point, the point of light produced on the other side of the lens will be at exactly the same distance from the lens. Any such pair of points are called "conjugate foci." Any number of luminous points will be simultaneously reproduced by the lens, and therefore any object will give rise to a corresponding image. The comparative linear sizes of the image and its object are proportional to the distance of each from the lens.

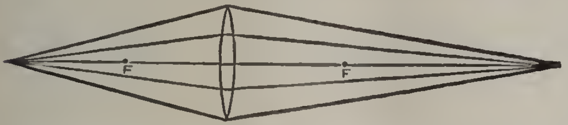

Fig. 14.

Concave or diverging lenses cannot cause a re-concentration of light that impinges upon them, and therefore they cannot form real images. They are used for photographic purposes only to modify converging lenses.

The images produced by lenses are formed by the refraction or bending of the light; and as the various constituents of ordinary light are not equally refrangible, each constituent produces its own separate image. In figure 15 the bundle of parallel rays, A, is supposed to consist of a mixture of red, yellow, and blue lights, the three most striking colours that are found in solar light. By any given lens the blue is more affected than the yellow, and the yellow more than the red; hence, in this case, the image is not simple, but consists of three points of lights of the three colours, and in the three positions respectively as shown. If a screen is placed to receive the blue image of the point, it will be found that the blue is not pure, that it is surrounded by an orange yellow, and that this tint again is bounded by a red ring, if we assume that the brightness of the three colours is sensibly equal. The screen, in the position we are considering, receives a round patch of red light, and on this a smaller, that is more concentrated and therefore brighter round patch of yellow, and in the middle a thoroughly concentrated, and therefore still more bright point of blue. The condition of affairs when the screen is removed to the focus of the red light is easily understood by the figure; the blue covers the largest space here, having spread out after being collected to a point at its focus.

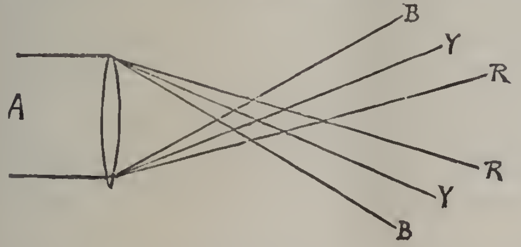

Fig. 15.

This experiment at once explains why the images produced by lenses that are uncorrected for chromatic aberration give images fringed with colour, for the colour in the body of the image itself is scarcely perceptible on account of the smallness of the proportion of colour taken from it to form the fringe. It is clear, moreover, that if the screen that receives the image is placed in the focus of the actinic light, that the image will show a red fringe to the eye, and that a blue tinted fringe indicates that the screen is further from the lens than the position where the brightest visual picture is formed.

This separation of light into its constituents is called dispersion, and Newton predicted that dispersion could not be neutralized without at the same time losing the effect of refraction. This, indeed, would be so if dispersion was always proportional to refraction, but practically, a prism of flint glass that gives the same amount of dispersion as a given prism of crown glass has a considerably less amount of refractive power. Thus it is possible by means of a flint glass concave lens to practically neutralize the chromatic aberration of a crown glass convex lens, and still to leave a residue of refracting power. This was shown to be possible by Hall, in 1733, and in 1757 Dolland constructed achromatic objectives for telescopes. Perfect achromatization with lenses is unknown, and when a combination of two lenses is used, it is only possible to get the foci of two parts of the spectrum to exactly coincide. Hence an achromatic combination made for ocular work only, if at its best, is not suitable for exact photographic purposes. A photographic lens should be so connected that the focus of the mean of the chemically active rays coincides with that of the brightest of the visible rays, so that the lens shall properly "work to focus." A sharper image can be obtained of the chemically active rays if the visible image is neglected, because then the available power of correcting the lens can be applied entirely to the actinic rays; and lenses have been so constructed for photo-astronomical work. With such instruments, however, focussing cannot be done in the ordinary way, the position of the actinic image must be determined, and the sensitive plate carrier must be fixed once for all in its proper place.

(*To be continued.*)

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.*

Hitherto the author has dealt mainly with the experiments and results of other observers. These results were sufficient to indicate the great importance and value of orthochromatic methods, and to constitute a real advance in photography. It was evident, however, that further experiments were highly desirable. Photographers who had actually put into practice the orthochromatic methods which had been proposed, gave very conflicting reports as to their value. Then, too, the question of the variations in the composition of the dyes, and the comparative or total inefficiency of certain samples, is obviously of the very greatest importance. Moreover, it seemed desirable to repeat Eder's experiments with the spectrum; not because any doubt attached to the work of so careful and able an investigator, but because results with the spectrum necessarily constitute the basis of the practical applications of these processes, and perfectly independent confirmation of new facts always has a certain value. The interest of the main question and of the side issues involved in it is so great that the writer of these articles was led to undertake a series of investigations, which are still in progress, but the first results of which have recently been communicated to the Nottingham section of the Society of Chemical Industry.† The experiments which have already been made were confined almost exclusively to dyes of the eosin group and cyanin, which have been shown by Eder, Schumann, and Mallman and Scolik to be the best sensitisers of all the dyes which have hitherto been employed for this purpose.

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* Continued from page 506.

† Journal of the Society of Chemical Industry, 1887, pp. 423-433.

The eosin group of dyes derives its name from eosin, the first member of the group which was actually employed successfully as a dye. These dyes have a somewhat complex constitution, and belong to a class of compounds which are known as *phthaleins*, because they are formed either directly or indirectly from phthalic acid. It is worthy of note that although they belong to the so-called *coal tar dyes*, they are not aniline dyes, that is, they are not prepared from, and have no direct relation to aniline.

The parent substance of the group is *fluorescein*, which is readily obtained by heating phthalic acid, or better phthalic anhydride (*i.e.*, phthalic acid which has been deprived of the elements of water) with resorcinol, a compound very similar to carbolic acid or phenol, and, like the latter, closely related to benzene. Fluorescein is a compound of twenty atoms of carbon, twelve atoms of hydrogen, and five atoms of oxygen; and is represented by the chemical formula $C_{20}H_{12}O_5$. It possesses what the chemist calls a phenolic function, or, in other words, behaves to a certain extent like an acid. Two of the atoms of hydrogen which it contains can be replaced by metals such as sodium, silver, or potassium, and the compounds which are thus formed have many of the characteristics of the class of compounds known as salts. Fluorescein itself will not dissolve in water, but the derivatives formed when the hydrogen is replaced by the metals mentioned, are soluble.

The principal eosin dyes are formed from fluorescein by the replacement of two, four, or six atoms of hydrogen by an equivalent number of atoms of chlorine, bromine, or iodine. The compounds thus produced are much more valuable as dyes, and have a far higher tinctorial power than the fluorescein itself. Like fluorescein, they are insoluble in water, and like it they contain two atoms of hydrogen, which can be replaced by two atoms of sodium, potassium, &c., with formation of compounds soluble in water. The great majority of the commercial eosin dyes contain either sodium or potassium in combination, and are soluble in water. These metals, in fact, are just as essential constituents of the dyes as the carbon, hydrogen, &c.

Eosin is fluorescein in which four atoms of hydrogen have been replaced by four atoms of the element bromine. Erythrosin is fluorescein in which four atoms of hydrogen have been replaced by four atoms of the element iodine. Phloxin is formed by the replacement of four atoms of hydrogen by bromine, and two by chlorine. Rose Bengal is formed by the replacement of four atoms of hydrogen by iodine, and two by chlorine. The relation between eosin and phloxin is precisely the same as that between erythrosin and rose Bengal. The chemical formulæ of these compounds are as follows:—

Fluorescein...	$C_{20}H_{10}O_5K_2$
Eosin	$C_{20}H_6Br_4O_5K_2$
Phloxin	$C_{20}H_4Cl_2Br_4O_5K_2$
Erythrosin	$C_{20}H_6I_4O_5K_2$
Rose Bengal	$C_{20}H_4Cl_2I_4O_5K_2$

C is the symbol for the element carbon, H for the element hydrogen, O for oxygen, K for the metal potassium, Br for bromine, Cl for chlorine, and I for iodine. The figures denote the number of atoms of each element which have entered into combination. These dyes have very striking optical properties. Their colours are beautiful and brilliant, and their tinctorial power is very great. The parent substance fluorescein has very little tinctorial power, but exhibits in a very high degree the beautiful phenomenon called fluorescence; hence, in fact, its name. When its solution is looked through, it has a pale yellow colour; but when the light is reflected from the surface of the liquid, or from the side of a glass vessel containing it, it appears to have a brilliant yellowish-green colour. Eosin also has the same property; when the light passes through its solution, it has a lovely delicate pink colour (hence the name, from *eos*, the dawn); but when the light is reflected from it, it is of a brilliant green. Phloxin is also fluorescent, but in a less degree. Erythrosin and rose Bengal do not show the phenomenon. The tinctorial power of the dyes increases, and the shade of colour becomes bluer as we pass from the top of the series to the bottom. Erythrosin and rose Bengal have the greatest tinctorial power, and the latter is bluest in colour. The property which these dyes have of forming definite compounds with silver which are highly sensitive to yellow rays has already been referred to.

Cyanin likewise has a complicated chemical constitution, but belongs to a different series of compounds known as the quinoline series. Cyanin, in fact, is frequently termed "quinoline blue." It is generally represented by the formula $C_{28}H_{35}N_2I$, and differs from the eosin dyes in containing two atoms of the element nitrogen (N), and no oxygen. It is much less stable than eosin and its allies, and decomposes very readily.

The author's experiments may be divided into three groups, namely (1), comparative examinations of a number of commercial samples of eosin dyes; (2), an investigation of the effect of the spectrum on plates stained with these dyes; (3), the application of plates treated with erythrosin to the photographing of flowers, paintings, pottery, and landscapes.

It has previously been explained that the different samples of dyes prepared by the same maker are distinguished by letters, whilst the same dye may be denoted by different names or letters by different makers. When applied to fabrics, the different samples produce somewhat different, though not dissimilar, shades of colour. The dyes actually examined were eosin A (Badische anilin und soda fabrik), eosin J J (Society of Chemical Industry), eosin S G F (L. Casella and Co.), eosin V E (Poirrier and Co.), phloxin (P. Monnet), phloxin (Meister Lucius and Bruning), erythrosin B (Casella and Co.), erythrosin 1 (Badische aniline und soda fabrik), erythrosin (Poirrier and Co.), erythrosin B E (Poirrier and Co.), erythrosin R E (Poirrier and Co.), erythrosin extra (Meister Lucius and Bruning), rose Bengal B (Meister Lucius and Bruning), and rose Bengal (P. Monnet). When solutions of the dyes of this group are examined by means of the spectroscope they show an absorption spectrum which is characterised by a strong dark band in the yellow or yellowish-green, according to the particular dye. The absorption band of eosin is darkest in the yellowish-green, that of rose Bengal in the yellow, whilst the other two are intermediate in position. The absorption band, in fact, is nearer to the red end of the spectrum, the lower the position of the dye in the series given above.

The identity or otherwise of the different samples was determined in the first place by examining the absorption spectrum, and measuring the position and breadth of the absorption band. It has already been explained that this mode of examination does not give precise information respecting the actual sensitizing effect of the dye, but it does serve as a means of distinguishing different dyes, and enables us to tell with considerable certainty, especially if used in conjunction with other tests, whether a given sample is a mixture, or consists only of a single substance. Details of the method of examination are given in the paper referred to, but they have no special photographic interest.

It was found that the four samples of eosin gave practically identical absorption spectra, and they were afterwards found to exert similar sensitizing effects. The results with the two samples of phloxin were not very definite; they are not identical, and it is not at all improbable that both are mixtures and not single compounds. Erythrosin B is decidedly different from the other erythrosins. It is distinctly fluorescent, whilst the others are not; its absorption band does not extend so far into the yellow; and it gives a precipitate with silver nitrate which is almost completely soluble in pure water, whereas the precipitate given by erythrosin is insoluble. The properties of this so-called erythrosin, in fact, indicate that it is a mixture of eosin with erythrosin or rose Bengal. Similarly, erythrosin BE gives an absorption spectrum which shows that it is really rose Bengal, and this conclusion was subsequently confirmed by the character of the sensitising action of the dye. Erythrosin extra, erythrosin 1, and erythrosin (Poirrier and Co.) and erythrosin RE, gave identical absorption spectra, and the first three were found to have practically the same sensitising effect. The two samples of rose Bengal examined are likewise identical, both in their absorption spectra and their sensitising action.

It was found, and the observation is of considerable theoretical interest, that the addition of ammonia has no effect on the absorption spectra of the dyes, and hence in all probability has no chemical action on the dyes themselves.

Most, if not all, the eosin dyes contain a certain proportion of water in chemical combination, but the quantity of water present in different samples is somewhat variable. One sample of erythrosin, for example, contained 8·8 per cent. of water, whilst another contained 12·2 per cent. It is doubtful, however, whether the variations are sufficiently great to produce any material differences in the relative sensitizing effects of the different samples.

It may be pointed out here that certain samples of eosins, &c., are not soluble in water, but dissolve only in alcohol. These contain certain organic radicles which are known as *ethyl* (C_2H_5), *methyl* (CH_3), &c., in place of the potassium or sodium which is present in the samples that are soluble in water. These varieties have no advantages as sensitizers over the soluble varieties, and the fact that they cannot be used in aqueous solutions, but must be dissolved in alcohol, makes them practically useless as sensitisers.

The results of this comparative examination show that whilst the names of certain of the dyes are misleading, there is very little difficulty in obtaining samples of good quality and uniform character without even the necessity of always purchasing from the same maker. It is, in fact, to the interest of the colour manufacturer to make his products as uniform in character as possible, for any variations in composition would lead to variations in the shades of the dyes when applied to fabrics, and this would speedily give rise to energetic complaints and a loss of custom.

Patent Intelligence.

Application for Letters Patent.

11,289. Julius Greth, 8, Quality Court, London, W.C., for "Improvements in coloured photographic printing."—Dated 18th August, 1887.

Specification Published.

12,238. John Edward Thornton, of 3, New Lorne Street, Moss Street, Moss Side, Manchester, in the county of Lancaster, Printer, for "Improvements in lens shutters and camera fronts."—Dated 27th September, 1886.

A blind-shutter in which a flexible material with a hole in it runs from one roller to another.

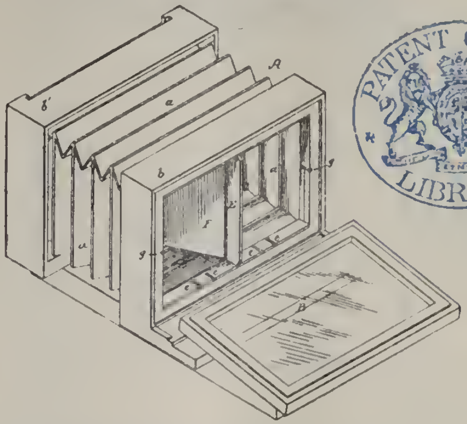
Patents Granted in America.

367,013. Prosper L. Senat, Philadelphia, Pa., for "Attachment for photographic cameras."—Filed May 9, 1887. Serial No. 237,580. (No model.)

Claim.—1. An attachment for photographic cameras, consisting of a wing constructed for application to and removal from an ordinary camera and extending into the box, so as to cut off the light from a portion of the plate to be exposed, substantially as described.

2. The combination, in an attachment for photographic cameras, of a strip constructed for application to the rear of the box, and having pivoted thereto a wing adapted to swing from side to side of the box, substantially as described.

3. An attachment for photographic cameras, consisting of a wing F, projecting into the box, and having a flexible flap around said projecting portion of the same, all substantially as described.



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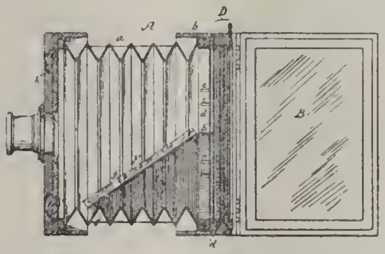
4. An attachment for photographic cameras, consisting of a pivoted wing for protecting a portion of the plate to be exposed, said wing being weighted so that on tilting the box the wing is caused to swing from one side of the same to the other, all substantially as and for the purpose set forth.



5. The combination of a camera-box with a cutting off attachment consisting of a wing extending into the box, and means whereby said attachment can be adjusted and retained laterally in different positions in the opening at the rear of the box, all substantially as specified.

6. The combination of a camera-box having in the frame recesses dividing the opening into quarters and thirds, with an attachment having a portion adapted to these recesses, and a wing extending into the camera, substantially as described.

7. The combination of an attachment extending into a camera box and protecting a portion of the plate, with a blocking-out plate adapted to be secured to the attachment, and to cover a portion of the plate not protected by the latter, all substantially as described.

8. The combination of the protecting attachment with a blocking-out plate, having a device for securing it to said attachment, the portions of the plate on opposite side of said securing device being of different size, all substantially as specified.

9. The combination of a camera-box with a removable protecting wing projecting into said box, and a spring-finger carried by said wing, and bearing at top or bottom against the frame of the box, all substantially as specified.

10. The combination of a camera-box with a removable plate-protecting attachment consisting of a wing projecting into the box, and having at the rear edge a flexible flap for bearing upon the plate, all substantially as specified.

366,224. Henry Kuhn, St. Louis, assignor to Henry A. Hyatt, Kirkwood, Mo., for "Photographic stamp portrait sheet."—Filed October 11, 1884. Serial No. 145,210. (No model.)

Claim.—1. As a new article of manufacture, a sheet of photographic pictures having the connection between the pictures weakened, substantially as set forth.

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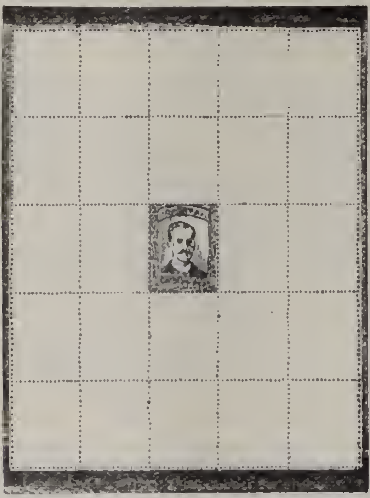
2. As a new article of manufacture, a sheet of photographic pictures gummed and adapted to be separated, as set forth.

3. As a new article of manufacture, a sheet of photographic



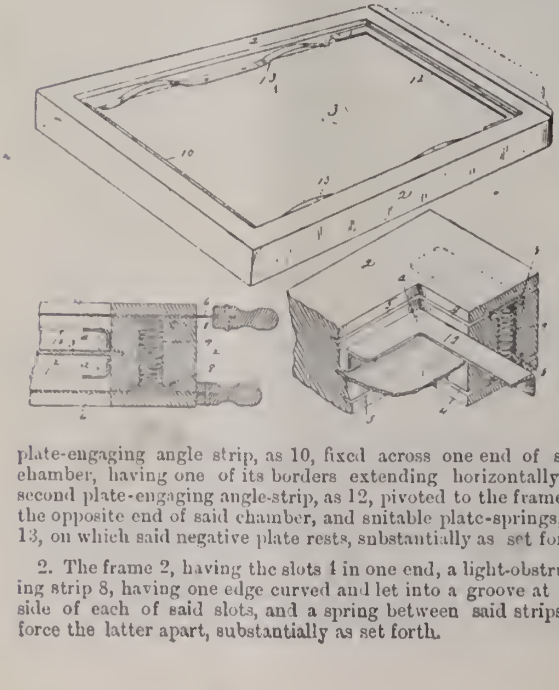
pictures adapted to be separated by intervening rows of perforations, as set forth.

4. As a new article of manufacture, a sheet of photographic pictures, gummed and perforated, as set forth.

5. As a new article of manufacture, a paper sheet having miniature even-toned fac-simile photographic pictures printed thereon in close order in rows extending up and down and across its face, such sheet being gummed at the back and having either rows of perforations or weakened lines between the rows of pictures, substantially as described.

367,480. Milan P. Warner, Holyoke, Mass., for "Photographic plate holder."—Filed March 21, 1887. Serial No. 231,628. (No model.)

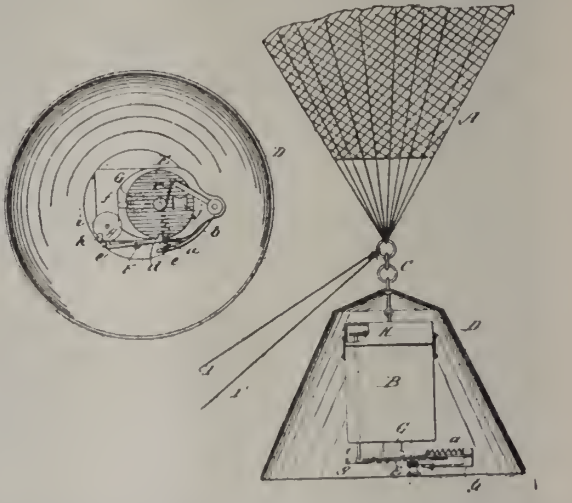
Claim.—1. A photographic negative plate holder consisting of a frame, substantially as described, having a plate chamber on one or both sides thereof, a slide plate to be moved through a slot in one end of said frame, and within grooves in the inner borders of the latter to close one side of said chamber, and a plate-engaging angle strip, as 10, fixed across one end of said chamber, having one of its borders extending horizontally, a second plate-engaging angle-strip, as 12, pivoted to the frame at the opposite end of said chamber, and suitable plate-springs, as 13, on which said negative plate rests, substantially as set forth.



2. The frame 2, having the slots 4 in one end, a light-obstructing strip 8, having one edge curved and let into a groove at the side of each of said slots, and a spring between said strips to force the latter apart, substantially as set forth.

367,610. James Fairman, N.Y., for "Apparatus for aerial photography."—Filed March 31, 1886. Serial No. 197,314. (No model.)

Claim.—1. The combination, with the camera-carrying balloon A, of two guy-ropes I I′, connected with one side of one of the suspension links of the camera for confining, guiding, and preventing the turning of the balloon and suspended camera, substantially as specified.



2. The combination, with the suspended camera, of a funnel-shaped shield having its apex attached to the suspension chain or link of the camera and extending downward over the camera, partly inclosing the sides and top of the camera, substantially as specified.

3. The combination, with the balloon A, camera B, and conical funnel D, suspended loosely over the camera, of the guy-ropes I I′, attached to one side of one of the suspension-rings of the camera for confining and guiding the balloon, substantially as shown and described.

Correspondence.

THE HYPOCHLORITE REDUCER.

Dear Sir,—Mr. Debenham, in your last issue, insinuates—on what grounds I cannot make out—that I have attempted to take to myself the credit of being the first to suggest hypochlorites as reducers. If he will refer to the article in question, he will find that I state: "I have not found this method described previously, though it may have been; but at any rate it is not so generally known as it deserves to be." I think this is sufficient answer to Mr. Debenham.

With regard to the method described by me in the Year-Book for 1886, I may state that it is *not* claimed as a novelty. The article was written in response to the Editor's request for a note on some matter of "practical experience." This method, which I had reason to believe was not generally known throughout the photographic world, I gave without any claim to originality. I simply described it "as the method which succeeds best in my hands," which it then was. Mr. Debenham will find many receipts given in the Year-Book which are not new to such experienced photographers as himself, but which it is a great benefit to the craft generally to have repeated.

At the hypochlorite of soda and alum reducer I did arrive without any outside information, but knowing my acquaintance with photographic literature was not sufficiently extended to warrant me in claiming this to be the first publication of the method, I expressed my uncertainty, in the article referred to, as to the originality of what I was describing.

I don't suppose my father will take the trouble to answer so frivolous an accusation as Mr. Debenham brings against him, but I may reply for him, that he, like myself, simply described a cheap and efficient method of reduction by the use of bleaching powder, which I had found effective, and he had proved to be good in his daily practice.

Wherefore, then, Mr. Debenham's surprise?—Yours truly,
RALPH W. ROBINSON.

Redhill, August 22nd, 1887.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

A MONTHLY technical meeting was held at 5A, Pall Mall East, on Tuesday, August 23rd, W. **England** in the chair.

F. **Green** showed some small photographs of the moon taken on the occasion of the recent eclipse. Afterwards he exhibited a dissolving lantern with motion so quick as to give the figures the appearance of moving from one position to another.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on Thursday, the 18th, A. L. **Henderson** president.

Two view meters were shown, one a pyramidal shape in sheet metal, in which an image is received on ground glass, as in an ordinary camera; the other a rectangular mahogany box, which contained a mirror fixed at an angle of 45°, for the purpose of reflecting the image on a screen at the top of the box.

A metallic plated developing tray fitted with lever for raising plates from the solution was also handed round for inspection. These articles were of commercial origin. Plates marked with the printed matter in which they had been wrapped were shown, and the probable causes discussed. Incidentally it was remarked that the American developer, the formula for which was contributed to the *British Journal Almanac* last year by W. Lincoln Adams, was both quick and certain in its action, and suited any plate.

J. **Traill Taylor** spoke highly of Eastman's modified formulæ, which, in his hands suited plates, films, or paper equally well. He then read the proportions as follows:—

No. 1.—	Boiling water...	32 ounces
	Sulphite of soda	6 „
	Citric acid	½ ounce
	(Or enough to make slightly acid)	
	Pyrogallol	1 ounce
No. 2.—	Boiling water	32 ounces
	Carbonate of soda	3 „
	„ potash	1 ounce

One ounce each of Nos. 1 and 2, and an equal bulk of water, formed the normal developer. He preferred to use more water, and give the plates longer in the solution. Any amount of opacity could be got with this developer.

The **Chairman** said that caustic potash and soda would certainly bring more detail out of an under-exposed plate than ammonia, but it was not so easy to get density. He then showed some extremely dense negatives developed in two minutes with ammonia.

The value of sulphites in developer was then conversed upon, and some objections raised to the employment of these salts.

A. **Mackie** regarded sulphites as valuable, especially ammonium sulphite.

A. **Haddon** said that as sodium sulphite was a solvent of silver bromide, it might be the cause of green fog. The action set up by the sulphite would probably be supplemented by the pyro in the developer, and so cause fog.

W. M. **Ayres** advocated soaking a known over-exposed plate in water, after which he said it was better to put on the pyro solution, and one-fourth the maximum proportion of ammonia; by adopting this plan he never lost a negative.

J. **Traill Taylor** stated that he had that day exposed some fogged negatives he brought with him from America, and it was his intention to try and develop the newly-impressed image without any of the original fog. One method he intended trying was the old acid pyro developer.

The **Chairman** said foggy plates could be cured by placing them in a nitric acid and a bromide solution, and exposing to sunlight; but that treatment would not answer in Mr. Taylor's case.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

ON August 16, the ordinary meeting took place at Myddelton Hall, A. **Mackie** in the chair.

The **Chairman** invited the members to continue the discussion upon Octavius Smith's paper on "Systems of Numbering Photographic Lenses and Diaphragms," which had been adjourned from the previous meeting.

Mr. **Dunmore** advocated the system adopted by the Photographic Society of Great Britain.

The **Hon. Secretary** considered that it was better to trust to one's experience than to trouble and perplex oneself with the many tables that had been compiled; but, in the case of a person just commencing photography, and without an experienced friend at his side to assist him, he thought exposure tables were better than nothing at all to guide him in his difficulty.

The **Chairman** said it was necessary to have some system by which we could convey our ideas to other people, and whatever system was to be adopted should be a universal one—one easy to work and easy to apply. He was in favour of the system recommended by the Photographic Society of Great Britain.

Mr. **Dunmore** said in ordinary landscape work he only used two stops—viz., $\frac{f}{32}$ and $\frac{f}{64}$.

George Smith used six stops for his combination set of nine lenses. He thought Mr. Smith had adopted the main principles of the area system. The public hated figures, and, still more, formulæ. Mr. Smith was quite wrong in his application of the area system.

Octavius Smith then proceeded to reply to the various arguments which had been brought up in the discussion. It appeared, he said, that one of the chief faults in this paper was its extreme accuracy. So far as the paper was theoretical he considered this point a great compliment; in the practical part, on the other hand, this extreme accuracy did not exist. Mr. Smith then proceeded to show, by reference to George Smith's published article on the area system, that the error which he had pointed out in his paper really did exist. In some cases it amounted to as much as one hundred per cent. With regard to a standard aperture, if $\frac{f}{16}$ were taken as the unit, we should get as comparative exposure numbers many more fractional numbers than if we took $\frac{f}{4}$, and he thought that private ideas ought to be sacrificed to some extent for the sake of uniformity. The Photographic Society of Great Britain had carefully chosen a unit for the benefit of the photographic world in general, and, unless very good reason could be given for using another standard, it would, he was sure, be better to adopt theirs. The subject of experience *versus* exposure tables was, Mr. Smith thought, somewhat beside the question; it would be very foolish for anyone knowing from experience the necessary exposure to use exposure tables. Mr. Smith mentioned two incidents which had by chance come under his notice during the past fortnight. A very experienced photographer who had just returned from a tour in the North, had given all his plates about four times the proper exposure; another very successful worker, with over twenty years' experience, having focussed the interior of a church, exchanged the stop for one of half the area, and could hardly discover the difference in the illumination of the two images. In conclusion, he said that in making these remarks, and in writing his paper, it was not his object to prove that exposure tables were safer than experience, or *vice versa*; he took for his standpoint this fact—that various systems of numbering stops existed, and the problem he had sought to solve was, which is the best.

Excursions were arranged for August 20, to Kew Bridge; August 27, to Oakleigh Park; and September 3, to Mill Hill.

The next meeting will take place on September 6, and the discussion will be upon "Lantern Matters." Visitors are invited.

Talk in the Studio.

Sayce's Note-Book for Photographic Exposures.—From B. J. Sayce, of Liverpool, we have received a very handy and well arranged note-book for photographers using the roll-holder. The author says :—"The ordinary note books for photographic exposures do not exactly meet the wants of those who use the films in roll-holders, and having found it necessary to design one for my own use, I send a copy which may serve as a guide for others who use spools. I attach great importance to the column for insertion of "winder's initials," as thereby double exposures may be avoided. Any publisher is at liberty to reproduce this book."

A Photograph of the Members of the Convention.—From John Stuart, of Buchanan Street, Glasgow, we have received two really fine photographs, measuring about 18 by 14, of the members of the Convention, the negative having been taken at Tarbert. One of those sent is a silver print, and the other a platinotype, and the former is much the better of the two. Indeed, we may suppose the silver print to have been made first; and it seems that before the platinotype was made the negative must have suffered several unfortunate accidents, resulting in the almost total obliteration of the rigging of a mast in the background, and in a mottled appearance of the sky. The photograph now referred to is not that which was issued recently with the *British Journal of Photography*, although taken in the same neighbourhood. We understand that Mr. Stuart will supply copies to those interested, at an almost nominal charge.

Balloon Photography. — The Royal Engineers have commenced a series of balloon experiments this week. A captive balloon was held at a distance of 1,000 feet or more from the earth, and observations were made on range firing. Some interesting photographic experiments have also been made from a small balloon which ascends to a height of about 400 feet. The cap is removed from the camera by an ingenious process, and after the balloon has remained in the air a few minutes, it is hauled down with a photograph of the surrounding country beneath. A captive balloon is being moored on the seashore at Dungeness, and experiments are to be made by firing shrapnel shell at it.—*Standard.*

First Annual Exhibition (1888) of the Photographic Society of India.—The exhibition will be opened early in January for a period of about three weeks, and medals will be awarded by judges to be appointed by the Society. Photographs need not be framed, but they must be mounted and in the hands of the Secretaries before 1st of January. Carriage on exhibits must be pre-paid, and full instructions given as to return or sale. Photographs to which medals are awarded will become the property of the Society, and the Society reserves the right of ordering further copies to be printed for distribution among members before a medal is despatched. The extra copies ordered will be paid for at fair rates. The following medals will be open for competition :—Class I (Open to the world)—His Excellency the Viceroy of India's own special medal, and the Society's gold medal for the best photograph in the Exhibition. A silver medal will be held at the disposal of the judges. Class 2 (Open to the amateurs of India)—Silver medal for best photograph in the Exhibition; silver medal for best set of not less than four photos; a silver medal to be at the disposal of the judges. All exhibits to be forwarded to the secretaries, Photographic Society of India, 8, Clive Street, Calcutta.

Moonlight Photographs.—The *Photographic Times* says :—"We do not believe that moonlight pictures require anything like the long exposures which are sometimes given to them. Unless the plate be extremely slow, seven hours' exposure is unnecessarily long. With an ordinary Carbutt 'Lightning' plate, and our own standard potash developer, we have made negatives by exposure in moonlight, from seven to ten minutes, which possessed as good or even better qualities than many instantaneous plates exposed in full sunlight."

Continental Pigeon Post.—The pigeon post is regarded by the Continental military authorities as a most important means of communication. The French government spends £4,000 per annum on its pigeons, Germany £1,700, and Russia £2,000. A complete system of communication by this means is established between all the fortified towns of Alsace-Lorraine.

Photographic Club.—The subject for discussion on August 31st will be "Stripping Films." Saturday outing, Kew; meet at Bridge Foot at 6 o'clock.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

T. Baker.—It is a little difficult to suggest a best method; but perhaps the best method would be to obtain a list of the photographers in the City, and to forward a note to each. The Directory is likely to be in the Library of the British Museum; or it may be seen at some of the leading Italian restaurants in London. To advertise in the photographic papers would probably be useless.

R. Davidson.—Try Poulton and Son's, Lee Green, London, S.E.

Foster Graham.—The condition of things you refer to is the result of there being no law on the subject, excepting as regards cases in which certain points have been attended to at the time of the original transaction.

M. M.—We will write to you on the subject.

Disappointed.—The notice was official, and published as soon as issued. Why did you not write at once?

Beginner.—The same will serve for both purposes. Write to W. E. Debenham, Massingham House, Haverstock Hill, N.W.

P. H. Davies.—The paper has been splashed at the back with something, and it takes time for the material to come through. It is probable that by holding the sheets obliquely to the light, and carefully examining the backs, you will be able to trace the markings on the unsensitized sheets.

Edward.—1. Not leaning against it, but against a pad which projected about eight inches. 2. It will answer fairly well, but will not prove so satisfactory as a woven fabric.

Amateur Photographer.—It will be much better to make a print on ordinary albumenized paper, and to mount it in the book. See article on page 471 of our issue of July 29th.

W. Holmes.—1. There is no such book in English, but we can, if you wish, give you particulars as to several works in French and German. 2. The relief sinks down as the film dries, and this can only be partially prevented by soaking the plate in a strong solution of sulphate of soda.

J. Gray.—Thank you for the photograph, and we hope soon to hear of success in regard to the other matter.

Chas. S. Dixon.—The asphaltum can be had from Hopkin and Williams, of Cross Street, Hatton Garden, London. It is sold in lumps, and you must powder it yourself.

Marine.—You may say "Patronised by the Queen," if this is the fact; but must not use the Royal Arms.

Photographs Registered.

W. P. Marsh (Bognor)—Photo. Sanger and Son's three Camels on the sands at Bognor; Photo. Sanger and Son's Elephants on the sands at Bognor; Photo. of Sanger and Son's Horse, "Black Eagle"; Photo. of Sanger and Son's Performing Elephant; Photo. of Sanger and Son's two white Horses.

J. Gregoire (Birmingham)—Photo. of W. T. Belcher.

Hughes and Mullins (Ryde)—5 Photos of Her Majesty the Queen.

T. Illingsworth (Halifax)—Photo entitled "Now Draw it Mild"; Photo entitled "The Story of a Mash"; Photo entitled "Oh, it's a good'un."

Guardia (Clapham)—Photo of a Flash of Lightning.

S. Becket (Saltcoats, N.B.)—Photo of South West of Scotland Curling Trophy; Photo of the first Winners of the South West of Scotland Curling Trophy.

The Photographic News.

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For Advertisement Scale see page v.

Advertisements should be forwarded (prepaid) to Piper and Carter, 5, Furnival Street, Holborn, E.C., to reach the office not later than noon on Thursday. A fee of 6d. must be forwarded when the Publishers are expected to receive and forward replies to Advertisements; and when they undertake the receipt of replies, they must be entrusted with the name and address of advertiser, for revelation to applicants, in case they may deem it necessary.

THE PHOTOGRAPHIC NEWS.

PATENT OFFICE LIBRARY

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PARTIALLY AMALGAMATED METAL PLATES FOR PRINTING.

From the *American Lithographer and Printer* we take some particulars as to the production of photographic and other printing plates by the partial amalgamation of metal, and although suggestions in this direction have already appeared in the Photographic News, the remarks of the paper referred to are worth quoting for the benefit of experimenters in photo-mechanical printing methods.

The article runs:—" When mercury is deposited on a metal, fatty lithographic ink will not "take" upon it when an inking roller is passed over it, and the black adheres to the untouched parts of the metal. If a well polished and clean plate of zinc is taken and a design will appear in brilliant white upon the grey background of the zinc. After tracing the design, an intaglio plate can be obtained by plunging the plate without being coated with varnish into a bath containing one hundred parts of water and two parts, at least, of nitric acid. The action of the acid is very rapid, and for a long time only attacks the parts touched by the mercury. When deep enough it can be used for lithographic work. If, instead of nitric, hydrochloric acid is used, the contrary effect takes place. The unaffected zinc is strongly attacked, and the traces of the mercury give a relief plate which can be used for ordinary typographical work.

" If the operator does not wish to draw upon zinc, the design can be traced upon paper with a salt of mercury. The sheet of paper being then applied for two hours to a plate of zinc, the drawing is sharply reproduced in white lines or amalgam, on the the grey surface of the metal, just as if it had been traced directly.

" The same result is obtained if the design is traced upon paper with a sticky substance (ink containing gum or sugar), and then dusted over with a mercury salt in fine powder. On dusting off the surplus and applying the sheet containing the design to a plate of metal, the same result is obtained. A similar effect is obtained if a newly printed proof is used, and is dusted with mercury salt while the ink is still wet and sticky. All the lines thus reproduced are chemically engraved, as has been described above. The same results are obtained by dusting with mercury salts a photographic carbon print containing a gummy substance, and the effect of half tints is even secured. Biniodide of mercury is the proper salt to use."

THE INTERNATIONAL EXHIBITION AT GLASGOW.

Regulations as to the Fine Arts and Photographic Section.

The Glasgow Exhibition will be opened in May, 1888, and will remain open until the end of October in that year; and the Fine Arts Galleries will be ten in number, occupying an area equal to 3,200 square yards, and affording about 2,450 lineal feet of hanging space.

The entire Exhibition will be watched day and night by police and firemen. Special attention will be given to the safety of the Fine Arts Galleries. Electric light will be used throughout the exhibition, and the mode of its application in the Fine Arts Galleries will obviate the risks incidental, under other conditions, to the use of artificial lights.

An Art Union will be organised in connection with the Fine Arts Sale Section, under the regulations of the Board of Trade. The price of tickets will be one shilling each, and the total receipts, after deducting necessary expenses, will be divided into prizes, to be selected from works exhibited in the Fine Arts Sale Section. The drawing for, and selection of, prizes will take place on a day to be fixed by the Committee prior to the close of the Exhibition.

The photographic section will be international in character, and contributions will be sought from the leading studios in Europe and America. The section will comprise illustrations of photography under the following heads:—(*a*) Portraiture, landscape photographs, architecture; (*b*) Reproductions of pictures, drawings, etchings, and engravings; (*c*) Photo-lithographs, photogravures, phototypy, photo-block-printing; (*d*) Illustrations of books; (*e*) Transparencies and enamels. All pictures sent must be framed and glazed, and must be delivered at the Exhibition Buildings, Kelvingrove Park, Glasgow, during the week ending the 24th March, 1888. All exhibits, unless such as are specially solicited by the Committee, must be sent carriage paid, or delivered free at the Exhibition Buildings. The Committee will undertake to unpack and re-pack such, and to store the cases at a charge of 1s. 6d. each frame. Any convenient number of photographs may be mounted in a single frame. All frames must be rectangular in form, without projecting corners. Oxford frames will not be accepted. At the back of each frame must be written the name and address of the exhibitor, the title of the picture, the process by which it is produced, and (if for sale) the price. This information must be repeated on a label attached by a spring to the top of the frame, so as to hang over in front. An advice form, filled in with the name and address of the artist in full, the titles of the works, and their prices (if for sale), must accompany all works sent in. Labels and advice forms will be supplied on application to the Secretary of the Fine Arts Section.

The following are the regulations for the Photographic Section:—All works will be subject to the approval of the Committee, whose decision shall be final. Arrangements will be made for the sale of pictures and duplicates, on which a commission of 5 per cent. on the catalogue price will be charged, whether the sale is made by the artist or by the Exhibition. At the close of the Exhibition, works upon which commission is due, or upon which any expenditure has been incurred, will be delivered up only on payment of such sum or sums. Sales effected by the artist should be intimated to the Secretary of the Fine Arts Section at once, otherwise a sale made by the Committee will be held to take precedence of, and supersede, the sale made by the artist. While the executive council will endeavour to take every care of the photographs sent for exhibition, they will not be responsible for injury or loss to unsolicited contributions, from any cause whatsoever, arising either in transit to or from, or during the currency of the Exhibition.

The following have agreed to act as corresponding members, and to give information and assistance to intending exhibitors :—London, T. Bolas (Editor of *Photographic News*), and J. Traill Taylor (Editor of *British Journal of Photography*); Paris, Léon Vidal ; Vienna, Dr. J. M. Eder ; Berlin, Dr. H. W. Vogel ; New York, F. C. Beach ; and Philadelphia, Fred. E. Ives.

REJLANDER'S PHOTOGRAPHIC STUDIES—THEIR TEACHINGS AND SUGGESTIONS.

BY A. H. WALL.

Some of the latest experiments of Rejlander were devoted to the study of lighting. He had come to the conclusion that the photographic glass-houses of the conservatory kind then common, and generally believed in, were mistakes. He concluded that greater solidity and force would be secured if all the light which had no part in the formation of the photographic image on the focussing screen could be either cut off—or shut out from the room ; that such light was not only useless, but mischievous ; that comparative darkness between the lens and the sitter would do wonders in perfecting the image on the focussing glass.

His experiments commenced with the construction of a darkened tunnel placed in front of his lens. This was made in a temporary way at first with screens, and afterwards in telescopic tunnels of various sizes and shapes, their interiors being painted a dead black. His theory was that as human eyes acquire greater penetrative power by looking through a vista of darkness towards objects in strong light, so that a man at the bottom of a well can see the stars at mid-day, his artificial eye, the camera, could have its power increased in the same way.

He had also the idea that this plan would not only shorten exposures by intensifying the brilliancy of the image on the screen, but would give the tones of light and shade greater power of expressing colour—in other words, would secure more perfectly their relative *values*. "At present," said he, in that quaint, odd, earnest way of expressing himself which was peculiarly his own, but which I shall not attempt to imitate, "I can get form and detail right enough, but insufficient diversity of texture ; I want more gradations." He wanted, in fact, that general tone which a first-class engraving gives, through which not only lights and shades are secured, but their exact relative degrees of intensity. "I see," he said, "in nature the tones of light or shade on flesh vary with their colour, are modified by texture and transparency or opacity, and that their diversity is consequently wonderful, and this is what I want to see in photographs."

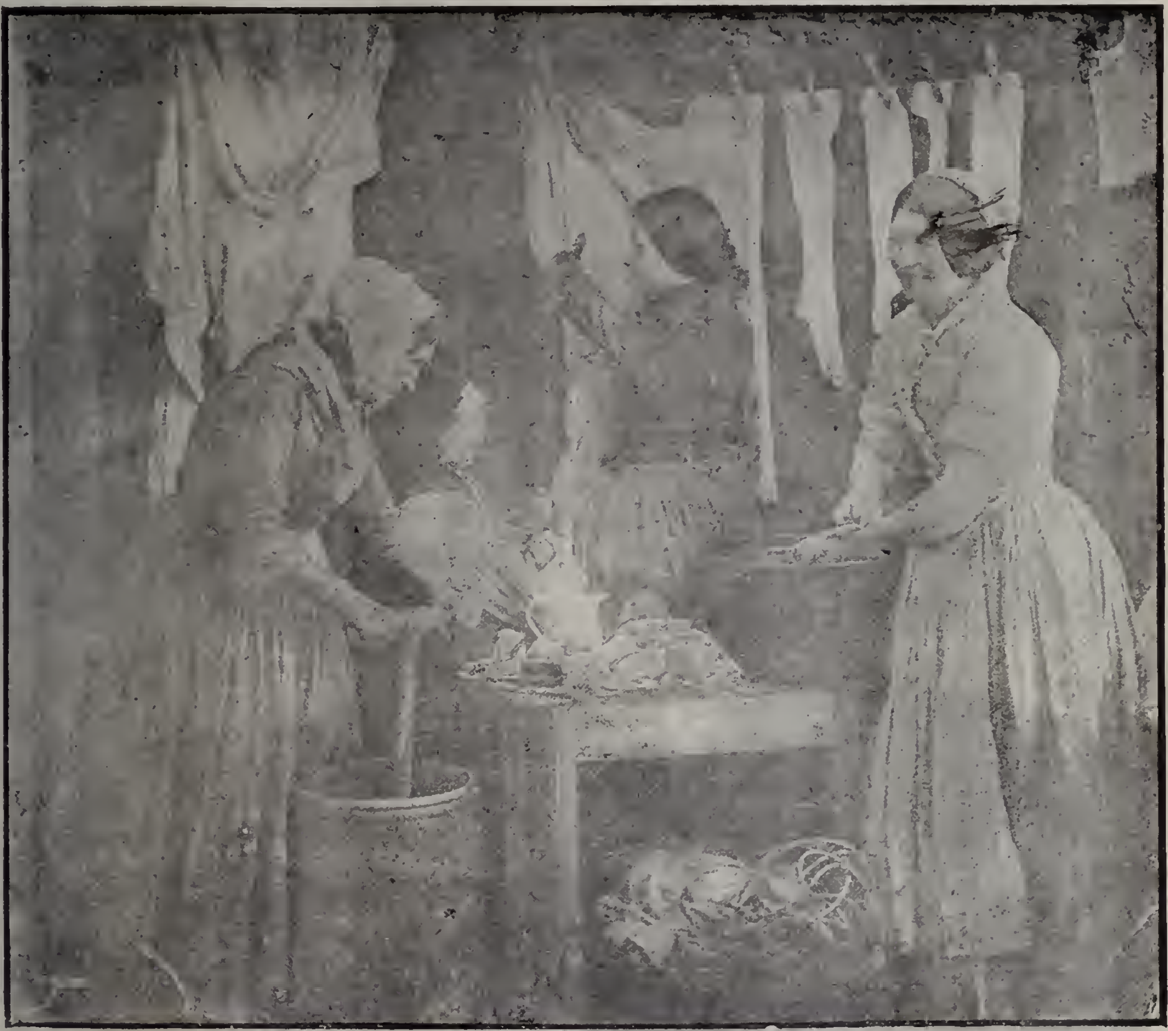
The final upshot of these experiments was not, however, a tunnel, but the planning of a new photographing room, which was not to be a gardener's glass-house, but an artist's studio, in which the sitter should feel cool and comfortable in even hot weather, and no all-pervading glare of light should unpleasantly oppress the eyes, half closing the pupils and contracting the brows. The camera part of it was to be low, narrowest, and windowless. The sitter portion was to be loftier and broader, and with a side and top light only, and no more of that than was necessary. The sloping top light, being the most direct and pure, was to be dominant in quantity and nearness, and long enough to be, with the aid of curtains, converted into a side top light, left, or right, or used as a direct front light, according to artistic requirements. The side light, which would face a garden wall, and be naturally less powerful than a skylight, was also to be rather smaller in quantity and a little in advance of the sitter. Thus arranged the artist-photographer thought the lighting of his models would be more picturesque, would give more artistic breadth of light and shadow with greater harmony of tones, make the head stand out dominantly as the chief point of interest, and keep the figure softly subordinate from top to bottom, each part in proportion to its distance from the head. He pointed out that the pure direct top-light would do the chief work, although it would be in effect a side light in advance of the sitter, and that the image in its progress from the model to the lens would not be intercepted by any large body of strong light. Many of my readers will remember how the room so planned was built with small modifications, accidentally enforced, and reluctantly adopted, and how it was described in the photographic journals ; how its merits were exalted and glorified, and how they were derided and sneered at. I have, myself, a very vivid remembrance of these things, because I was living close by Rejlander at Hampstead when it was projected and erected, and played a somewhat conspicuous part in the controversy that arose at Society meetings and in the journals. I also superintended the building of two or three such studios, and found them excellent, and fulfilling all their promises in most situations. There were some for which they were unfitted, and others for which they were fitted only in summer, becoming, when the light grew weak and the days short, anything but desirable—at any rate, from a professional point of view. Some gave splendid effects in one part of the day only. Aspect was everything. Rejlander himself was thoroughly

DALLASTINT

O. G. Rejlander as Garibaldi.

satisfied with his new studio, in which he executed some of his most admired works. I know at one time of the year he considered it rather lengthened exposures, and, in a general way, I believe this had much to do with the pretty general non-adoption of studios built on the Rejlander plan. But that objection has been losing force ever since, and I think, if I were now once more building myself a studio, and could select a suitable spot, no better form could be erected for artistic work than the "tunnel studio," originally designed by my dear dead friend and fellow-worker. Some little time after, when he worked in a large handsome drawing-room-like studio close to the Victoria Station, he often wished he could exchange it for his old tunnel studio at Hampstead, often in my hearing and to me.

Among the examples of his work supplied me for the present paper is a portrait of himself costumed as Garibaldi, whom he was told, and I think believed, he very strongly resembled. That patriotic and noble man had no two admirers more enthusiastic than Rejlander and myself were. He was very proud of his personal resemblance to the Italian hero, real or fancied, and at that time I was proud to photograph, free of charge, any of the many Englishmen who were going to fight with, or had fought with him, as volunteers in the cause of national freedom. Several of my personal friends were amongst these, and two were photographers, who afterwards settled in Italy. All did their duty well and valiantly. It was no child's play—as you may remember—either to march or or fight with Garibaldi. He neither spared himself nor others when brave deeds were a-doing, and the very costume he and his merry men wore was evidently meant for work, not show. Bravest of warriors, purest of patriots, a courteous, sympathetic, generous gentleman of Nature's own creating, was Garibaldi, and my esteem for him has outlasted Rejlander's only because I have outlived him.



The Washing Day.

Another of the examples is "The Washing Day," a domestic subject treated with scrupulous regard to literal accuracy, but one which deals with the bare facts of its subject, embracing neither humour nor story to any picturesque or particularly interesting extent. It composes, however, capitally, and in the original, as I remember it, printed under Rejlander's own eye, the light and shade were far less patchy in their general effect than they are here. There was greater depth and fulness, more vigorous relief in the foreground figures, and altogether greater clearness and brightness. The remaining examples either speak for themselves, or need no special description.

Several of the photographic productions which have been reproduced for the series of papers I am now concluding were exhibited anonymously, but they never failed to so stand out from the surrounding photographs that they won special critical notices. In an exhibition of the Photographic Society of Scotland, and in some foreign

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A Study.

I'm a Young Girl from the Country, but you can't get over me.

exhibitions, they were shown as the productions of "an amateur," and I remember Rejlander laughingly explaining this by saying, "When I compare what I have done with what I think I ought to do, and some day hope I shall do, I think of myself as only an amateur, after all—that is to say, a beginner."

The Unexpected.

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.*

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Spectrum Experiments.—The spectroscope employed in these experiments was a single prism instrument of the ordinary construction. In place of a solid glass prism, a hollow prism filled with colourless carbon bisulphide, was used, in order to obtain greater dispersion. It is, of course, absolutely essential that the carbon bisulphide be free from the least trace of yellowness, otherwise it would cut off a large proportion of the blue and violet rays, and thus give very inaccurate results. The ordinary object glass of the observing telescope was removed, and replaced by a lens of about twenty-one inches focus; the eyepiece was taken away, and the open end of the telescope was fixed in the lens hole in the front of an ordinary studio camera with long bellows. The back of the camera was fitted with a horizontal swing, which is necessary in order to get the whole length of the spectrum in focus at the same time.

The source of illumination used in experiments of this kind exercises considerable influence on the result. In this "climate of samples," as it has been termed, sunlight is so rare and uncertain that it is impossible to obtain constant exposures throughout a long series of experiments. Moreover, the character of sunlight—that is, the relative proportions of blue, yellow, and red rays which it contains—is extremely variable,[*] the variations depending on causes which at present are not very clearly understood. The source of light selected was burning magnesium ribbon, which is now readily obtained at a comparatively very low cost. If the slit of the spectroscope is made narrow, a somewhat considerable length (say 3 feet) of ribbon can be burnt for each exposure, and if a long length is burnt at a uniform rate the effect of any inequalities in the ribbon is eliminated, and the exposures may be regarded as identical. There is another great advantage in using magnesium. It has previously been pointed out (pages 66 and 67), that a prismatic spectrum is defective, in that the various rays are not separated in proportion to their wave-lengths, the red, orange, and yellow rays being very much crowded together, whilst the blue and violet are spread out to a much greater extent than they ought to be. If we suppose the length of the spectrum to be divided into 1,000 equal divisions, in a prismatic spectrum the distance from the line A to the yellow line D will be represented by 220 divisions, whilst the distance from D to the line H at the violet end will be 780 divisions. In a normal or diffraction spectrum, in which the distances between the rays are proportional to their wave lengths, the distance from A to D will be 468 divisions, and from D to H 532 divisions. It is obvious, therefore, that with a prismatic spectrum the effect of the red, orange, and yellow will be magnified in consequence of the crowding up of the rays, whilst that of the blue and violet will be reduced for the opposite reason. A prismatric spectrum is, however, more easily obtained, and more easily used. Now it is well known that the light from burning magnesium is exceptionally rich in blue, violet, and invisible rays of high refrangibility.[†] It is, in fact, proportionally very much richer in these rays than even sunlight. The brightness or optical effect of sunlight at a certain zenith ditance is 524·7 times as great as that of a certain quantity of burning magnesium, whilst its chemical effect is only 36·6 times as great. In other words, the proportion of rays of high refrangibility (blue, violet, and ultra-violet) to those of low refrangibility (yellow, orange, and red) is very much greater in the light from burning magnesium than in sunlight. It follows that this high proportion of rays of high refrangibility will tend to neutralise the defects of the prismatic spectrum, and results obtained with a prismatic spectrum of the light from burning magnesium will resemble more or less closely the results obtained with a diffraction spectrum of sunlight. The spectrum of burning magnesium shows the sodium line D, a line *b* between E and F due to the vapour of magnesium, a group of lines near F due to the oxide of magnesium which is formed by the combustion, and a line in the bluish violet. These lines and bands serve conveniently as reference lines in place of the dark lines of the solar spectrum (fig. 4). The magnesium ribbon was paid out at a slow and uniform rate by means of clockwork, and the apparatus was so arranged that the magnesium lamp and the spectroscope itself were outside the dark room, whilst the telescope and the camera were inside. The same length of magnesium wire was burnt for each exposure, the actual length required being ascertained by preliminary experiments. Some undyed plates were exposed under the same conditions.

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* Continued from page 541.

The dyes were applied to the gelatino-bromide by the bath process exclusively, the plates used being Paget XXX. Some of the plates were prepared with aqueous solutions of the dyes, and others with ammoniacal solutions. In the first case the plates were soaked for two or three minutes in water, and then for two minutes in the following bath :

Dye solution (1 : 1,000)	1 part
Water	9 parts

When ammonia was employed, the plates were soaked for two or three minutes in

Liquor ammonia ·880	1 part
Water...	99 parts

and then for two minutes in

Dye solution (1 : 1,000)	1 part
Ammonia (1 : 10)	1 „
Water	8 parts

The plates were drained with their lower edges on blotting-paper, and dried in the dark. It will be observed that both the aqueous and ammoniacal solutions contained the same proportion of dye, namely 1 in 10,000.

The exposed plates were developed with alkaline pyro which contained in each fluid ounce

Pyrogallol	1 grain
Ammonium bromide	3 grains
Liquor ammonia ·880	6 „

These proportions were found to be best suited for this series of experiments, and are not given as a formula for general work.

Some experiments were made with *night blue, ethyl purple, crystal violet*, and *violet 5BO*, but although these dyes exert a strong absorptive action on the orange, yellow, and green when in aqueous solution, they exert very little sensitising action on a gelatino-bromide plate. The results of these experiments agree with those previously obtained by Eder with the same dyes.

The eosin dyes used were selected from those which had been compared by examining their absorption spectra, &c. They were eosin A ; eosin S G F ; eosin Y E ; erythrosin (Poirrier) ; erythrosin 1 ; erythrosin extra ; erythrosin B E ; phloxin (P. Monnet), phloxin (Meister, Lucius and Bruning) ; rose Bengal (P. Monnet) ; rose Bengal B.

Cyanin was also examined ; the plates being prepared according to Schumann's formula (page 194).

The results obtained are represented by curves in the manner previously explained (fig. 4), the reference lines being the lines or bands in the spectrum of burning magnesium. The curves are constructed from observations of the rate of development of the different parts of the plate, and from comparisons of the densities of different parts of the negatives after fixing. Each curve is the mean result of several experiments. It is useless to make elaborate

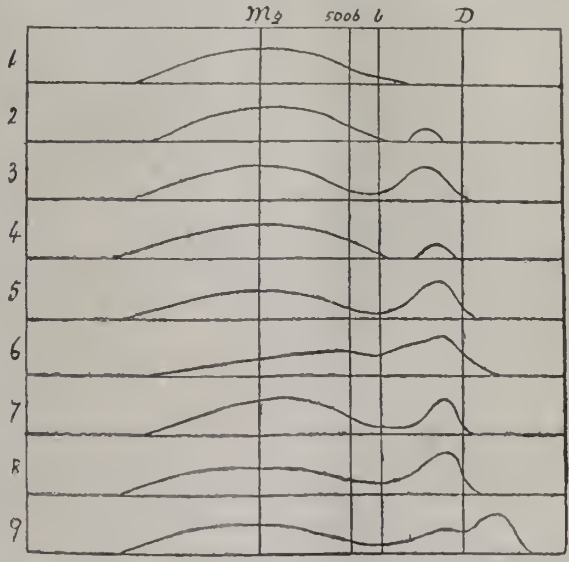

Fig. 1.—Photographs of the prismatic spectrum of burning magnesium on (1) ordinary plate, and plates stained with (2) aqueous eosin, (3) ammoniacal eosin, (4) aqueous phloxin, (5) aqueous erythrosin, (6) ammoniacal erythrosin, (7) aqueous rose Bengal, (8) ammoniacal rose Bengal, (9) ammoniacal cyanin.

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[*] Vogel. Berichte der deutschen Chem. gesellchaft 1874, p. 88.

[†] Bunsen and Roscoe. Philosophical Transactions 1859, p. 920.

measurements of the densities of the negatives, for the relative densities of the different parts are not constant quantities, but vary with the character of the developer, the length of time the plate is allowed to remain in the developer, and the time of exposure. The results will also vary somewhat, though not materially, with different batches of plates prepared by different formulæ.

The author's results agree in their general character with those previously obtained by Eder. The action of the spectrum on the dyed plates is represented by curves which show two maxima, the first in the blue and violet, which is due to the ordinary sensitiveness of the gelatino-bromide ; and the second in the yellow, orange, and green, due to the presence of the dye. The sensitiveness to the ultra-violet is in most cases reduced by the presence of the dye.

When cyanin is used, the maximum sensitiveness is in the orange and orange red, whereas with the eosin dyes it is in the yellow or greenish yellow. At the same time it produces considerable sensitiveness to yellow, and it will be observed that the second half of the curve shows two maxima, one on each side of D. This fact has been observed by Eder and by Schumann (see fig. 3), and the absolute agreement between the results of three independent observers may be taken as establishing beyond a doubt the character of the sensitising action of this dye.

Eosin in aqueous solution exerts a distinct though slight sensitising action, and practically the same effect is produced by phloxin, though in the latter case the maximum effect is somewhat nearer to the line D. Erythrosin produces by far the greatest effect, whilst the action of rose Bengal is likewise strongly marked, it being much superior as a sensitiser to aqueous eosin, but inferior to erythrosin.

When the dyes are applied in ammoniacal instead of aqueous solutions their action as sensitisers is very much increased. Not only is the maximum effect greater, but the action extends to a greater distance on either side of the maximum, and thus tends to remove the region of minimum action in the green. With some of the plates which had been prepared with ammoniacal erythrosin it was difficult to recognise the occurrence of any region of minimum action. The effect of ammonia is greatest in the case of eosin, but even under these conditions eosin exerts a somewhat feebler sensitising action than aqueous erythrosin. With erythrosin and rose Bengal the effect of ammonia, although not so great relatively, is still very striking. Erythrosin in ammoniacal solution is the most powerful sensitiser for the less refrangible rays with which the author is acquainted.

The most remarkable and important result of the author's experiments is that gelatino-bromide plates steeped in a bath of aqueous or ammoniacal erythrosin, ammoniacal rose Bengal, or ammoniacal cyanin, *become more sensitive to the less refrangible rays of the prismatic spectrum* (*yellow, greenish yellow, orange*) *than to the blue or violet*—a reversal of the usual order of things. This result is the more remarkable since the source of light employed is exceptionally rich in chemically active rays of high refrangibility. With the spectrum of sunlight there can be little doubt that the effect would have been still more striking. Eder found that silver gelatino-chloride stained with eosin is as sensitive to yellowish-green as to violet, and Vogel states that the commercial Clayton and Attout plates are twice as sensitive to spectrum yellow as to the blue, but the author is not acquainted with any other published records of gelatine plates more sensitive to rays of low refrangibility than to those of high refrangibility. In this series of experiments—that is, with a prismatic spectrum of the light from burning magnesium—plates dyed with aqueous erythrosin or ammoniacal rose Bengal were about half as sensitive again to the yellow as to any part of the blue or violet; plates dyed with ammoniacal erythrosin are about two and a half times as sensitive to yellow as to blue or violet; plates dyed with ammoniacal cyanin are about half as sensitive again to orange as to blue or violet. In the case of erythrosin, the result with the spectrum is confirmed by the fact that plates treated with an ammoniacal solution of this dye were found to be quite as sensitive, and not unfrequently more sensitive, to the light reflected from yellow pigments than to that from blue pigments.

It will be seen that whilst the author's results agree entirely with those of Eder in their general character, they differ considerably in the magnitude of the effects observed. The differences may be due (1), to the use of plates prepared in a somewhat different manner; (2), to the fact that in many of Eder's experiments the dye was added to the melted emulsion, whilst in the author's it was always applied in the form of a bath ; (3), to the fact that Eder's bath solutions (1 : 20,000—1 : 30,000) were considerably weaker than those employed by the author. Comparative experiments showed that Eder's formula for the preparation of dyed plates for general photographic purposes gave a dye solution too weak to produce the maximum effect. The author's results may be taken as further evidence of the superiority of the bath process over the method of adding the dye to the emulsion before coating.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter X. — Spherical Aberration — Aplanatic Lenses — The Spectroscope — Colour-Absorbing Media—Illumination of the Dark Room—Circumstances that Affect the Chemical Activity of Light.

If a single landscape lens is attached to a camera with no diaphragm, it will be found impossible to get as sharp definition as is generally desired in a photograph ; but if, by means of suitably-cut pieces of blackened card placed close to the lens, the light is allowed to pass only through its central part or its outer part, it will be found possible to focus the picture, and it will be observed that the picture produced by the centre of the lens is markedly further from the lens than the picture produced by its outer part. This is because the surfaces of the lens are spherical ; and the want of coincidence of the focal points of different parts of the lens in passing from its centre to its circumference is, therefore, called "spherical aberration."

A plano-convex lens, with its convex side towards the distant object—or, better still, a double convex lens, the radii of the curved surfaces of which bear the proportion to each other of about one to six—suffers very little from spherical aberration. Such a lens so arranged is occasionally useful as a finder, because its aperture may be large, and the image it gives proportionally bright ; but the field over which it gives a good enough definition for practical photography is too small to be useful. By turning such a lens round with its most convex side towards the focussing screen, a larger field is covered ; but the definition throughout is confused. The spherical aberration consequent on the position of the lens may be reduced by the use of a diaphragm. The ordinary single landscape lens of modern make is almost invariably of the meniscus form, because the field covered is still larger than with a plano-convex ; but the spherical aberration is greater with the meniscus, and it is therefore necessary to use a smaller stop.

Spherical aberration can be corrected in combinations of lenses by the use of suitable curves, and lenses that are corrected so that they can be used with their full aperture are termed "aplanatic."

We have already seen that when light passes through a dense medium such as glass, whose opposite sides are not parallel, the path of the light is bent out of its original course; and also that whenever refraction is produced by a single medium the constituents of the light are unequally refracted, and therefore separated. A prism, as optically understood, is a piece of glass, or its equivalent, with its opposite side parallel in one direction and inclined in the other direction; and a spectroscope in its simplest form is a prism and a screen with a narrow slit in it for the light to pass through before it impinges upon the prism, so that the separated constituents of the light may overlap to the least possible extent. By means of such an instrument, any light will give its own characteristic spectrum, and so reveal its exact nature to the scientific observer.

For detailed information concerning the sensitiveness of silver salts and other compounds to light of different refrangibility, the reader is referred to Capt. Abney's "Instructions in Photography." It will suffice for our present purpose to bear in mind that ordinary photographic sensitive materials are most affected by the more refrangible of the visible rays, and therefore that blue light is more photographically active than green, green more than yellow, and yellow than red. And although blue or violet indicates the limit of visibility, there are rays still more refrangible which are rich in chemical activity, and distinguished as the "ultra-violet" of the spectrum.

By means of spectrum analysis one can not only determine the nature of any given light, but also the absorbing effect of any medium that is only partially transparent, or transparent to only certain kinds of light. The most important use of absorbing media is in the construction of dark room windows, and lanterns that are required to give the safest light for the manipulation of sensitive materials. A crude and unscientific review of the facts of the case led to the general use of ruby glass when gelatine dry plates were introduced. Ruby glass is very faulty for this purpose in two ways. An insufficient depth of tint allows a little blue light to pass through it, an amount that is useless as contributing to the visible illumination, but highly dangerous to sensitive surfaces, because of its great photographic activity. If the ruby tint is deepened to get rid of this element of danger, it is at the expense of so much safe light that the remaining illumination is no more than sufficient to make the darkness visible. No light is absolutely safe—that is, any visible light will affect a gelatine dry plate if time enough is allowed. It remains, therefore, merely to find that light which for a given amount of photographic activity yields the greatest illuminating effect. It is almost universally acknowledged now that yellow is superior to red so far as ordinary sensitive materials are concerned, but it is necessary to beware lest the yellow medium is such as will allow too much green to pass through it.

In photographing interiors where the windows are glazed chiefly with yellow and red glass, a protracted exposure will be necessary, although the flood of light appears such as to warrant a short exposure.

The moisture in the air is a great enemy to rapidity of exposure, and its effect is not only uncertain, but chiefly invisible, and therefore not to be estimated by the most experienced eye. In general language, about half the photographically useful light that reaches us from the sun on the best of days consists of ultra-violet radiations, and is therefore quite unable to affect the eye; and of the other half, the violet and blue, which are the most useful, have a very small visible illuminating effect. The air may therefore be photographically foggy when it is quite clear to the eye, and the visibility of a fog is always very much less than its photographic effect.

Exposures must be shortened at high elevations, because there is less of the air intervening between the sun and the object; and the nearer the sun is to the horizon, whether at early morning or late in the day, or in the winter, or in regions remote from the equator, the more must the exposure be lengthened, because the oblique rays have a greater distance of air to travel through.

The proportional chemical activity of the light at Iceland, Manchester, and Cairo, on the 25th March, for each hour during the day, is shown in the following table:—

AM.	P.M.	Iceland	Manchester.	Cairo.
6	6	0·	0·	0·
7	5	·02	·22	1·74
8	4	1 53	5·85	20·12
9	3	6·62	18·71	50·01
10	2	13 27	32·91	78·61
11	1	18·60	43·34	98·33
Noon		20 60	47·15	105·30

In this connection it is interesting to notice the chemical activity of the light that reaches the various planets.

Neptune	·04	Mars	137·1
Uranus	1 0	Earth	318·3
Saturn	3·5	Venus	608·9
Jupiter	11·8	Mercury	2125·0

Presuming other things to be equal, photographic exposures on the planet Mercury would only be about seven times as rapid as with us, while the equivalent of an exposure of one second with us is about a minute and a half at Saturn, five minutes at Uranus, and two hours at Neptune.

The two tables just given are due to Professor Roscoe.

Many terrestrial substances exercise a very important absorptive effect upon the ultra-violet rays, and are, therefore, detrimental to photographic work when the available light has to pass through them. Dr. W. A. Miller made an extensive series of experiments in this direction, and he found that while rock crystal was the most transparent to the ultra-violet rays, ice, water, white fluor spar, and pure rock salt, in thicknesses up to ·75 of an inch, were scarcely at all inferior to it. By passing the light examined through a space two feet long filled with either air, hydrogen, carbonic acid, carbonic oxide, or ammonia, there was no appreciable loss. But among a large number of other bodies examined, solids, dissolved substances, liquids, and gases, there is not one that does not stop a considerable proportion of photographically active light. The solar light, however, that reaches us is considerably reduced by passing through our atmosphere, and the majority of subjects tested do not appreciably affect the solar light available under ordinary circumstances. Those given in the following table are the only ones likely to interest the photographer.

The last column indicates the extent of the ultra-violet transmitted, the ultra-violet of the solar spectrum being divided into ten degrees. The higher the figure, therefore, the less the absorption observed; but these figures cannot in any way be made to show the proportionate diminution of photographic action, because the ultra-violet of the solar spectrum is not of uniform intensity throughout its extent.

Material tested.	Thickness of layer. *In inches.*	Ultra-violet transmitted. *In solar spectrum.*
Solids.		
Crown glass (greenish)	·74	6·5
Flint glass	·68	5·5
Faraday's optical glass (pale yellow)	·54	1·5
Saturated solutions of solids.		
Hyposulphite of soda	·75	8·5
Silicate of soda	,,	8·5
Nitrate of silver	,,	6·0
Cyanide of potassium (not quite pure)	,,	5·5
Ferrous sulphate		5·0
Liquids.		
Nitric acid, S.G. 1·3 (colourless)	·75	6·5
Oil of turpentine	,,	4·5
Bisulphide of carbon	,,	2·5
Vapour of.		
Bisulphide of carbon	24·0	1·5

The use of glass lenses, therefore, tends to uniformity of exposure under various conditions of the atmosphere, for their retarding effect only comes into play when the air is free enough from mist to transmit those extreme ultra-violet rays that glass absorbs.

With this chapter we finish our consideration of preliminary and general matters, and in the next we shall begin the study of practical photography with a critical review of apparatus.

(*To be continued.*)

Notes.

The Parliamentary Bill against fraudulent marking and trading, referred to in detail on p. 513 of our issue of August 19, has received her Majesty's assent, and is now an Act of Parliament. As far as the photographic trade goes, its interest centres on the penalty of imprisonment for applying to goods a "false trade description." Readers should refer back to the article.

A fashion paper has some absolutely sensible remarks on the reasons why people are so frequently dissatisfied with their photographs. Among the first is, that in all probability we each look most kindly on our own faces when seen in the mirror. It is almost positive that we are not familiar with our own features– witness the shiver with which a lady receives the declaration, "How much you look like Mrs. So-and-So!" when she does not think that person the type of beauty to which she belongs; and with what a thrill of satisfaction she hears the same declaration when it coincides with her own wishes of resemblance. This feeling, no doubt, is at the bottom of our satisfaction or dissatisfaction with the results of the photographer's skill.

Speaking of likenesses between people, a curious instance occurs to us of the utter inability of anyone to form an idea of what he or she is really like. A well-known writer, whose facial appearance was very striking from the white flowing beard and hair and the dark bushy eyebrows, was continually being told that he had been seen in various parts of the city when, at the very moment of his appearance there, it was absolutely certain he was in his own house. It was apparent he had a double somewhere, and at last he discovered who it was who was so much like him. As people who had seen both men were so struck with the extraordinary resemblance, he became very curious as to what the other was like, and whether the resemblance was so strong as had been asserted. Of course he himself was the last person in the world capable of judging, but, forgetting this, he determined to call upon his double. The latter was a merchant in the city, and the writer, sending in his card, was ushered into the presence of the commercial magnate.

The meeting must have been a curious one, for it is certain the two were strangely alike. The result of the interview was, however, to the persons concerned not entirely satisfactory. The man of letters explained his errand, and, fully confident that the advantage in the way of good looks was on his side, awaited the reciprocatory compliments which he expected would follow. The city magnate looked at his visitor, not by any means admiringly, and touched a hand bell at his side. "Mr. Smith," said he to his chief clerk, who had entered: "Be good enough to look at that gentleman!" "Yes sir." "Do you see any likeness between him and me?" The clerk was a shrewd man, and could read the expression on his master's face. "Any likeness, sir!" he exclaimed, in a contemptuous tone; "Oh dear no, sir; not in the least," inferring as plainly as possible that to speak of the countenance of the visitor in the same breath with that of the city man was an insult to the latter. After this the *litterateur* could do nothing but bring the interview to as speedy a termination as possible, and gracefully retire. "Well," said a friend who was anxiously waiting outside, "and was he like you?" "Not a bit," rejoined the other. "If I thought I was like that pompous fellow, I'd"——there is no necessity to finish the sentence; it is sufficiently expressive. But we cannot help speculating what the city magnate's opinion would have been supposing his visitor had been a prince!

Dissatisfaction has been expressed at the new plan adopted by certain manufacturers of bromide paper of numbering their packets instead of putting the date as heretofore. This seems to be a matter of some importance, as the manufacturers in question announce that they will not be responsible for defects in paper used six months after the date of manufacture. This time could be easily calculated when the date was attached to each packet, but who is to construe the meaning of a mere number? It would be interesting to know the reason of the change.

A weekly paper, describing a new actinic illuminant, goes on to proclaim exultantly that "it is now possible to take negatives in absolute darkness!"

A capital portrait of Sir Howard Grubb appeared in last week's *Illustrated London News.*

An artist who has just taken up photography thought he had made a great discovery the other day. He was chatting with a photographic friend over the merits of various detective cameras, and the buttonhole circular camera, which takes six pictures on one plate, came under discussion. On the photographer pointing out what seemed to be the drawback—viz., that some of the pictures might be over-exposed, and others under-exposed, yet all would have to be developed together—the artist exclaimed, "I can see how it can be done: surround each picture with a little wall of wax, and put a different developer into each!" The idea certainly was ingenious, but the photographer was not sanguine as to its practicability.

Almost simultaneous with our suggestion last week, that the Princess Beatrice should employ her camera to photograph the hundred uniforms of the Prince of Wales, came the announcement in a society journal that she had been hard at work in taking negatives of the numerous Jubilee gifts presented to the Queen. This really opens up a useful and honourable occupation for the Princess and her husband. The journal in question says, "These photographs would have an enormous sale at bazaars, or through the ordinary channels of commerce." Quite so; and if Prince Henry could only be induced to take up photography, we should say that he would soon be in a position to "keep himself," and forego the handsome income which the British taxpayer is called upon to furnish. Naturally, some of the court photographers would complain if all their business were taken out of their hands by a member of the royal family; but this cannot be helped.

The forger in his relation to photography is treated of in a readable article which appears in a recent issue of *La Nature*, and the writer, after having pointed out that years ago photography did distinct service to the forger, says that now the tables are turned, and the forger is often frustrated in his work by the photographer.

A reproduction of an altered cheque is given, in which the old writing, although effaced to the eye, comes distinctly to light in the camera, and mention is made of an instance in which a falsifier attempted to obliterate writing by spilling ink over it; but the camera brought out the original words. Again, a photographic enlargement of a doubtful signature is well known to be easier to recognise as false than is the original writing, and A. Londe, who writes the article, tells us that enlarged photographs of counterfeit coins assist very materially in the recognition of these as spurious.

The Convention at Chicago, which we have already alluded to several times, was marked by an unusually large display of good photographs.

In referring to matters transatlantic, we may mention the tastefully designed and executed form of diploma, issued at the joint annual photographic exhibition, recently held in New York by the Society of Amateur Photographers of New York, the Camera Club of Boston, and the Photographic Society of Philadelphia. The diploma is executed in collotype (Artotype Co.) from a wash drawing by Charles B. Williams, and is symbolical of the various classes of photographic work; and is dated in rather large letters, "New York, April 1st, 1887." In England the date April 1st would immediately suggest some kind of practical joke or sell in connection with the matter; but perhaps this is not so in the United States.

Of all forms of retouching, that applied to photomicrography is about the worst. It is therefore gratifying to find the New York Micrographical Society following in the wake of the Royal Microscopical Society, and condemning the use of the retouching pencil when applied to negatives produced by microscopists. During a recent discussion elicited by the exhibition of a collection of photo-micrographs made by the late Dr. J. J. Woodward, Mr. C. F. Cox remarked that with all the improvements which had been made during late years in the construction of lenses, it was noticeable that the quality of Dr. Woodward's work in photography had not been materially excelled. Dr. Woodward had once made the mistake of painting out the background and surrounding objects, but criticism had caused him to abandon the plan, and microscopist workers with the camera had learned a good lesson, and that was to let their negatives alone after they had been taken. An expression of opinion was made by a member that a particular photograph of Dr. Van Heurck was better than one taken of the same subject by Dr. Woodward, but it was pointed out that Dr. Van Heurck's photographs showed decided signs of manipulation. It was Dr. Van Heurck's photographs which excited the strong condemnation of Mr. J. Mayall, Jun., to whose remarks attention at the time was called in these columns.

Review.

Photographic Printing Methods: A Practical Guide to the Professional and Amateur Worker. By the Rev. W. H. Burbank. (*Royal octavo, 216 pages. Cloth boards. Price one dollar. New York, 1887: The Scovill Manufacturing Company, 423, Broome Street.*)

Carefully selected paper, good printing, and tasteful binding, make—in the greater number of instances—American photographic books attractive to the reader; but in the case of the book before us we have two other great merits—low price and excellent matter.

A good general hand-book of printing methods has for some time been one of the things needed in the English language, and we congratulate the Rev. W. H. Burbank on the way he has filled the need.

Concerning the chapters treating of printing on albumenized paper, little is to be said except that the subject is pretty exhaustively treated; but the value of the book rests upon the fact that it deals with the various photomechanical methods, photo-ceramics, carbon printing, emulsion methods of making positives, pictures on opal glass, and other less practised modes of producing prints.

There should, one would expect, be a considerable sale for the book in England.

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.

Pompeii.

"I stood within the city disinterred,
And heard the autumnal leaves like light footfalls
Of spirits passing through the streets! and heard
The mountain's slumberous voice at intervals
Thrill through those roofless halls."
—*Shelley.*

Nobody is allowed to photograph or sketch in Pompeii and Pæstium without special permission. This may be obtained at the Museum in Naples, where, on production of your passport, a printed form is filled up and handed to you. Sunday is the best day for Pompeii, that being the only time when you may wander at will among the ruins without a guide; it is also a free day. The weather was delightfully still and sunny during our visit, and the quiet hours spent in the narrow lava-paved streets, the theatres, temples, and houses, passed all too quickly, while we photographed and sketched.

Mr. Sommers, the great landscape photographer of

Naples, was there with cameras and assistants; he seemed to be thoroughly enjoying his work, and kindly gave us hints as to some of the best points. Mr. Sommers speaks English well, and does a large business with Americans and our countrymen in bronze and terra-cotta copies of Pompeian statuary, &c. The Italian Government is carefully excavating, and not half of the city has yet come to light.

In A.D. 63 an earthquake overthrew the city, and it was still rebuilding when the great catastrophe took place which overwhelmed it. The celebrated letter of Pliny the younger to Tacitus gives a most thrilling description of the terrible rain of stone and ashes which came so suddenly upon Pompeii, and on many other places around Naples. No lava reached the town, but the weight of ashes buried many people, and the noxious vapours suffocated others.

He wrote from Misenum, where he and his mother were at the time. They were out of doors for protection from earthquakes, and were leaving the high road for fear of being crushed by crowds of people. He says: "We had scarcely stepped out of the path when darkness overspread us, not like that of a cloudy night, or when there is no moon, but like that of a room when it is shut up, and all the lights extinct. The greater part of the people imagined that the last and eternal night had come, that the gods and world would be destroyed together."

This took place in the day time; and when the dense cloud lifted, the ground was seen to be covered deeply with white ashes, which looked like snow. The catastrophe commenced with a thick shower of small pumice stones, which covered the streets to the roofs of the houses; ashes followed, and became solid by the successive showers of boiling water. Most of the inhabitants appear to have been quickly suffocated by poisonous fumes.

Pompeii has been so often described that we need not attempt to give a list of the chief houses, temples, baths, &c. We will merely mention the objects that we noticed during our hasty visit. The lead water-pipes and taps in many houses were in a remarkably good state of preservation, and looked as if they might have been put in by one of our present day plumbers. At a wine-shop the excavation brought to light the chalked-up score against some *habitué* who has long since departed, leaving his bill unpaid. Some of the marble fountains at the junctions of streets still stand as evidence that many of the people drank water; for, in leaning forward over the trough to get at the tap, the countless hands have worn deep places in the marble. It seemed strange that such useful institutions had fallen into decay, and that out of the hundreds who daily passed up and down the hot, stony streets, and refreshed themselves at the fountains, there should now be no one left.

There are beautiful mosaic fountains also, notably the fountain of Masks; the mosaics are of glass, fresh and beautiful in colour; the water flowed from the masks, and at night lamps were placed inside them. We saw an artist sketching one of these fountains in all its intricacy of detail, probably to be made use of in the design for some modern fountain.

The streets are paved with lava, mostly in blocks, taken in layers from basaltic columns. This is the hardest kind of lava, and would seldom require repairing; yet wheels have worn deep ruts in it, and great blocks were placed as stepping-stones for foot-passengers passing over the streets. They must have been very much in the way if horses were made use of in the town. Forbes thinks that the huge stepping-stones must have prevented any horse traffic, and that the ruts were made by hand barrows.

The streets are narrow, and deep down below the footpaths, during heavy rain, the water would flow as a river, and the stepping-stones would be needed.

The bakers' shops with the ovens and the mortars for grinding corn are in good preservation, and many of the charred loaves are shown in the small museum at Pompeii. Vesuvius forms a grand background to many of the photographic subjects, whether in looking down the Forum, the Street of Tombs, through the Arch of Mercury, or over the great Amphitheatre. Vesuvius, with its wreaths of smoke, is always seen, reminding the traveller of its awfully destructive power, and contributing to the solemnity and loneliness of the pictures.

FORUM.

ARCH OF MERCURY.

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AMPHITHEATRE.

The amphitheatre is far away from the excavated portion of the city. You walk over the yet buried portion through cultivated fields, and among flocks of goats.

We eat our lunch while sitting at the top of the amphitheatre, and also took an effective photograph afterwards of the vast building and Vesuvius. The amphitheatre would hold 12,800 people, and is 400 feet long. It is well preserved. There are two theatres in the town—the tragic theatre, containing 28 tiers of seats, and room for 5,000 people; and the comic theatre, holding 1,500: an inscription says that the latter was roofed in. There is some handsome carved marble about the stage, and occasionally marble is met with in the houses. The house of Cornelius Rufus contains his bust, and carved pedestals of marble tables. The train soon conveys you back to Naples, and at many places *en route* you can see how the line has been cut through the great hard, compact, Vesuvian lava beds; in some places it is being quarried for building or paving stone.

Ischia.

The scenery in the island of Ischia is very beautiful, and to anybody who has not seen the effects of a great earthquake, a visit to the ruined town of Casamicciola will vividly bring to mind what such a catastrophe means.

A steamer, described in the bills as *Vapore très Magnifique*, leaves Naples two or three times a week, returning the same day. There is now but little traffic, and the *Vapore très Magnifique* is an ancient little wooden steamer in which, on the River Mersey, we should be chary of trusting our valuable lives. However, if the steamers have deteriorated, the fare is still "magnifique," being 10 francs. The width of the steamer was about 15 feet, and forty-six steps took me from stem to stern.

Soon after leaving Naples clouds gathered over Ischia, and during our two or three hours on the island it rained heavily most of the time, and photos were taken under an umbrella. On landing we climbed the steep road to Casamicciola: ruins lay all around, and the road becoming impassable for carriages, we took two small boys as guides, and made our way up the narrow path, between the *débris* of the fallen houses. We were soon in the centre of the once flourishing and beautiful town. The mind naturally reverted to the dead, quiet city of Pompeii; but here was ruin and desolation which, from its modern and fresh aspect, affected the spirits far more, and made one feel too vividly for words, the utter hopelessness of its deserted position. We stood in a city of ruined houses, not a soul in sight except ourselves and our guides. Behind us lay the crumbled walls of the church, on which a small cross has been erected to indicate its former sacredness. On a hill to the left stands the shattered remnant of the Hotel des Etranges, splendid in situation, and probably looking more picturesque in death, with its trailing creepers and weeds, than it ever did before. Here stands the half fallen doorway of a fine villa residence, the gatepost remaining to hand the name down to posterity; and there, lower down the road, a shattered palace exhibiting a mouldering board, whereon it is stated that the owner is willing to sell the whole property. At a meeting of four roads a shrine and a cross are left standing, and the passer-by still worships there. Down in a deep valley at our feet were numerous other buildings, once fashionable baths, the favourite resort of wealthy Neapolitans. Here are the most picturesque and the finest ruins. The beautiful valley, backed up by Mount Epomeo, with its deep earthquake rifts, now encloses ruins of hotels, bath-houses, and pensions, tenanted only by the bat, owl, and snake. Lovely tendrils and creepers are beginning to beautify the scene with their own wild luxuriance, giving some of the ruins already an ancient appearance. You begin to wonder where the remnant of the people is stowed; but shortly after leaving by the carriage road for the town of Ischia, behold what might be a backwoods modern settlement, a sight in one way more melancholy than that of the ruined town. The new hamlet is a collection of wooden huts with zinc roofs, and the plainest of churches. The inhabitants say it would be useless to rebuild Casamicciola unless the volcano would break out and relieve the pent-up gases and vapours which have accumulated in that part of the island.

If Epomeo would once more burst forth, this lovely region might again bring happiness and prosperity to its once-thriving people; at the same time a volcano cannot be regulated, and the cure might be the greater evil. Leaving the hamlet we pass over the old lava stream of 1302, not yet entirely crumbled into soil, and further down the coast we come upon Largo del Bagno, the port of Ischia. This is a deep crater lake of circular form; an opening has been cut on the seaward side, and a lighthouse stands at the entrance.

As we sailed back to Naples the weather cleared, and the sun shone gloriously over Capri and Sorrento.

> "At length the sun began to peep,
> And gild the surface of the deep."
> —*Somerville.*

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CARBON PRINTING: EXPLICIT INSTRUCTIONS FOR PROFESSIONAL AND AMATEUR PHOTOGRAPHERS.

BY MAX BOLTE.*

Printing.

Having selected the negatives that are to be used, separate them according to their density. The printing frames must be as free from dust as possible, and perfectly dry. The light should be subdued before the sensitized carbon paper is resorted to. See that the negatives are free from dust, take a piece of carbon paper, dust it well on both sides, and place it over the negative, gelatine side in contact with it. Cover with a piece of rubber-cloth or a felt pad (must be absolutely dry), and close the back of the printing-frame. When all the frames have been filled in this way, expose to light, and place the photometer close by them. Watch the photometer, and when the required tints are reached, turn those frames over which correspond. Proceed in the same way with all of them. The requisite exposure given, the printing frames are taken back to the dark room and emptied, and the printed carbon papers are now laid away in a light-tight box, and, if possible, some pressure applied to them.

Should there be some hard negatives, it is best to expose the printed carbon sheets for a few moments to daylight, which would give them a softer appearance; but care should be taken not to allow the light to act too long.

The printing for double or single transfers is exactly the same, but for transparencies a longer exposure to light is necessary.

N.B.—Care must always be taken never to employ damp tissue paper.

Since the gelatine side of the tissue is pressed in contact with the negative, it is evident that if it retained the slightest adhesiveness on its surface, it would be dangerous to press it against the negative. However, there is a very efficient remedy, which was first employed by Mr. Swan; it is simply to dust the negative and the carbon paper with some steatite (French chalk or talc). Of course the dusting must be done in a careful way, and by means of a camel's air duster as much as possible of the steatite should be removed. This imperceptible coating offers two advantages: first, it is a discoverer, for if there is any moisture left in the tissue, when passing the brush over it the steatite will adhere in patches to any moist places, and will not spread in a scarcely perceptible coating; second, it prevents an excessive adsorption of light in those parts of the carbon tissue which are in such absolute contact with the negative as to prevent the reflection from its back surface. The dusting of paper or negative, or both, does not cause any imperfection in the print.

Single Transfer Process.

This process is free from any difficult operations, and may be described as follows:—

The exposed carbon tissue, together with the single transfer paper, is placed in a tray containing water of not over 58° F., and after some minutes are withdrawn together from the water, placed on a glass plate or wood board, and squeegeed together. They must now remain in contact for at least fifteen minutes, and slight pressure may be employed; placed in a tray containing lukewarm water, when the tissue paper will separate from the transfer paper, leaving the carbon on the latter, and the development is now completed. The developed picture is then placed in an alum bath for ten minutes, well washed, and hung up to dry.

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* Continued from page 456.

Having subdued the light, a sheet of tissue is taken, dusted carefully on both sides, and immersed in the water contained in the tray, which must not exceed 58° F. The same is done with the transfer paper, but as many as five, or even more, may be placed in at once, for it does not make any difference if they remain some minutes more in the water. The tray containing the carbon tissue is rocked all the while, and care must be taken that no air-bubbles remain adherent to the tissue. It first curls, but must remain entirely immersed, or it might reticulate (especially during hot weather), when this precaution was not taken. After about two minutes the tissue flattens out, and this is the very moment to withdraw it from the water.*

The glass plate, which must be somewhat larger than the transfer paper, should be clean and free from all dust. Place the transfer paper, glossy side up, upon the glass plate. Lay the tissue paper, carbon side down, upon the transfer paper, cover with the rubber-cloth, and apply the squeegee from centre to borders, first using gentle pressure, and later applying more. Now withdraw the rubber-cloth and examine, holding the papers horizontally against the light, if they have been well pressed into contact. Remove any moisture which might be present at the borders by means of a moist sponge or linen towel, and hang up to dry. As it often happens during hot weather that the carbon tissue does not properly adhere to the transfer paper, it is better to place the squeegeed papers between two glass plates and put a weight on, leaving them under pressure for fifteen to twenty minutes, then suspend them to dry. Proceed with all the sensitized tissue and transfer papers in the same way, and place the second on top of the first and so on, but always cover them with a glass plate and use pressure. The same water which has served for the first tissue and transfer paper may be used for all the rest, provided that its temperature does not rise above 58° F. The development may be made after fifteen minutes, but not sooner.

As soon as the tissue papers have been moistened, daylight may be admitted, for sensitized carbon paper is only sensitive to light when dry.

If there are small size tissue papers, as many as the transfer paper will hold may be squeegeed into contact with it, thus simplifying the developing and other operations very much.

The rubber-cloth should not be too thick, and must always be placed with its cloth side upon the paper.

The water must stand at least four inches deep in the trays; better if deeper.

N.B.—Never proceed to develop until the bichromate has entirely covered the taansfer paper, which is easily seen by the yellowish colour it assumes.

Single Transfer Paper.—This is a water-proof paper, having on one side a bright gloss. It is made in rolls exactly like the carbon tissue, covered on one side with a gelatine layer rendered insoluble by the addition of chrome alum. It may be also made as follows. Well-sized white paper is soaked for fifteen minutes in a sufficiently strong solution of shellac in alcohol; or it may be soaked in an aqueous solution of shellac, consisting of 3 parts of common unbleached shellac and 1 part of borax boiled in 30 parts of water. Papers prepared by this latter formula have a nice pink colour. Single transfer papers can be bought the same as the tissue paper, for they are made by the same manufacturers.

Development.—This operation can be conducted in full daylight, for it is essential to be able to estimate the different degrees of developing in the picture. Proceed as follows:—Place your table, provided with hot (Summer Queen stove or other contrivance) and cold water supply, conveniently. Prepare the alum solution and filter it repeatedly, as will be explained later on. Be sure that your hot water is boiling. Now take the first of the transferred papers and place it, tissue side up, into the developing tray, and pour cold water upon it. The water must stand at least one inch deep in the tray. Rock it and be watchful to remove any air-bells which may appear, for if not removed they will most likely show later as black spots in the picture. Having soaked the papers, remove them, add some hot water, rock the tray to mix the hot and cold, and re-immerse the paper, continuing to rock the tray. Around the borders of the tissue paper will appear black lines, and by and by the tissue paper will lift from the transfer paper, which indicates that the gelatine of the former is sufficiently softened to allow of its removal, and this must be done with care, withdrawing the carbon paper holding it by one corner, with a steady motion, keeping both papers under water.

Having removed the tissue paper, there is now a black slimy mass of gelatine before your eyes. In gently rocking the tray, the water by degrees washes away all the gelatine which was not rendered insoluble by the action of the light, and the picture appears with all its contrasts, half-tones and high lights.

Should the development go on too slowly, some more hot water must be added, always removing the print from the tray before each addition. In case some parts of the picture should remain too dark, hot water may be locally projected upon those places, in which case its action will be mechanical.

Should water of 104° F. not develop the picture, it indicates that the exposure was carried too far. In order to remedy this there are two ways, either to employ still hotter water (of say 112° to 115° F.), or to add a few drops of liquor ammonia fortis. When properly managed the picture will come out all right. The development is finished when, holding it inclined, no more black particles are visible in the water which runs off. The picture is now rinsed with cold water of 60° to 70° F.

If the exposure was right, and the negative not too thin, the picture on development will be very vigorous, with all desirable half-tones; but if the exposure was too short the deep shadows alone will appear, and the half-tones during development will be gradually washed away, and if the development is carried still further the entire image will disappear.

If the negative is too hard, the half-tonee will disappear partially, and in such a case the only remedy is to take paper which had been sensitized two days before. This is the only recourse which the practical carbon printer has when a negative is too dense.

N.B.—(1.) Never employ the same water for soaking the print which has served to develop or rinse a developed picture; always use fresh water. (2.) Over-print a little, and after soaking the prints in cold water use hot water by degrees up to 112° F., and the prints will come out far more brilliant and with greater contrasts than if printed exactly to their photometric degree and developed with not such hot water. (3.) When, after soaking the print, too hot water is employed, small air-bells will form, which are rather tenacious, and unfortunately are not very easy to get rid of. (4.) A good plan is to place the picture carbon side down, after removal of the tissue paper, and to allow it to develop automatically.

Failures.—The most frequent failure is the non-adherence of the tissue to the transfer paper, and during development the picture separates from the transfer paper. This is due principally to a too rich bath of bichromate, and very often happens during hot weather, the cause being that the tissue, during drying, becomes insoluble.

The strength of the sensitising bath should be as follows—

Temperature from 68 to 76° F. ... ... 3 per cent.
" " 76 to 86 ... ... 2 "
" " 86 to 92 ... ... 1 "

Another cause of failure is the formation of many little air-bells when separating the tissue from the transfer medium. This is due to the fact that for the first soaking of the paper too hot water had been employed. The remedy is water of a lower temperature, and longer soaking. The third failure is the so-called "reticulation," of which we shall speak later on in particular. A slight alkalinity of the developing water is favourable, since the gelatine is easier dissolved; however, too much (expressly added carbonate of soda or ammonia) causes reticulation or makes the image granular. Acid water develops slower, but the pictures are finer and stronger.

(*To be continued.*)

OUT-DOOR PHOTOGRAPHY.

BY S. DELICATE.*

In the course of his remarks he said the paper was intended for beginners and members who had recently joined the Society, more than for the older members. He divided it under three heads—the lens, the view, and the development—and pointed out that the best lens for general out-door work was one of rapid rectilinear or rapid symmetrical type, these being the proper lenses for architectural subjects. But in some cases, such as landscape with only buildings—as cottages—a single view lens would often give brighter negatives than the former. And in some views it is necessary to employ a wide angle lens to enable the photographer to get in all the view he requires. The ratio of the stops was next explained, and it was shown how the stops may be measured and numbered. Under the second head—the view—the speaker remarked that every photograph ought to be so taken that it will have a striking and also a pleasing effect at first sight. Several kinds of composition were then explained. Light and shade, and contrast, were dealt with, and directions were given as guides to correct exposure.

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* The carbon paper may be left longer in the water, even for hours, and during hot weather I would recommend to leave it for about five minutes.

* Extract from Paper before the Birmingham Photographic Society.

In the last part it was considered how best to develop a plate after it had been exposed. He kept all his chemicals in separate bottles, and by this means was able to modify his developer to suit any plates or any exposure. Then he explained how to treat different exposures: for an over-exposed plate, mix a developer with a good supply of pyro, a large quantity of bromide, and a very small quantity of alkali; but for an under-exposed plate the developer would contain a very little pyro, little bromide, and a large proportion of alkali, to commence with. As soon as the details were well out, add more pyro and bromide to obtain density. He concluding by saying that an amateur having mastered the use of his lenses, how to place a view on the ground glass in an artistic manner, and develop the negatives properly, had secured a good grasp of what is necessary for out-door photography.

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THE SUN'S HEAT.

BY SIR WILLIAM THOMSON, LL.D. F.R.S. M.R.I.[*]

Professor of Natural Philosophy in the University of Glasgow.

From human history we know that for several thousand years the sun has been giving heat and light to the earth as at present, possibly with some considerable fluctuations, and possibly with some not very small progressive variation. The records of agriculture, and the natural history of plants and animals within the time of human history, abound with evidence that there has been no exceedingly great change in the intensity of the sun's heat and light within the last three thousand years; but for all that, there may have been variations of quite as much as 5 or 10 per cent., as we may judge by considering that the intensity of the solar radiation to the earth is 6½ per cent. greater in January than in July; and neither at the equator nor in the northern or southern hemispheres has this difference been discovered by experience or general observation of any kind. But as for the mere age of the sun, irrespective of the question of uniformity, we have proof of something vastly more than three thousand years in geological history, with its irrefragable evidence of continuity of life on the earth in time past for tens of thousands, and probably for millions of years.

Here, then, we have a splendid subject for contemplation and research in natural philosophy or physics—the science of dead matter. The sun, a mere piece of matter of the moderate dimensions which we know it to have, bounded all round by cold ether,[†] has been doing work at the rate of four hundred and seventy-six thousand million million million horse-power for three thousand years; and at possibly a higher, certainly not much lower, rate for a few million years. How is this to be explained? Natural philosophy cannot evade the question, and no physicist who is not engaged in trying to answer it can have any other justification than that his whole working time is occupied with work on some other subject or subjects of his province by which he has more hope of being able to advance science.

It may be taken as an established result of scientific enquiry that the sun is not a burning fire, and is merely a white hot fluid mass cooling, with some little accession of fresh energy by meteors occasionally falling in, but of very small account in comparison with the whole energy of heat which he gives out from year to year. Helmholtz's form of the meteoric theory of the origin of the sun's heat may be accepted as having the highest degree of scientific probability that can be assigned to any assumption regarding actions of prehistoric times. The essential principle of the explanation is this; at some period of time, long past, the sun's initial heat was generated by the collision of pieces of matter gravitationally attracted together from distant space to build up his present mass; and shrinkage due to cooling gives, through the work done by the mutual gravitation of all parts of the shrinking mass, the vast heat-storage capacity in virtue of which the cooling has been, and continues to be, so slow.

In some otherwise excellent books it is "paradoxically" stated that the sun is becoming hotter because of the condensation.[*] Paradoxes have no place in science. Their removal is the substitution of true for false statements and thoughts, not always so easily effected as in the present case. The truth is, that it is because the sun is becoming less hot *in places of equal density* that his mass is allowed to yield gradually under the condensing tendency of gravity, and thus from age to age cooling and condensation go on together.

An essential detail of Helmholtz's theory of solar heat is that the sun must be fluid, because even though given at any moment hot enough from the surface to any depth, however great, inwards, to be brilliantly incandescent, the conduction of heat from within through solid matter of even the highest conducting quality known to us, would not suffice to maintain the incandescence of the surface for more than a few hours, after which all would be darkness. Observation confirms this conclusion so far as the outward appearance of the sun is concerned, but does not suffice to disprove the idea which was so eloquently set forth by Sir John Herschel, and which prevailed till thirty or forty years ago, that the sun is a solid nucleus inclosed in a sheet of violently agitated flame. In reality, the matter of the outer shell of the sun, from which the heat is radiated outwards, must in cooling become denser, and so, becoming unstable in its high position, must fall down, and hotter fluid from within must rush up to take its place. The tremendous currents thus continually produced in this great mass of flaming fluid constitute the province of the newly-developed science of solar physics, which, with its marvellous instrument of research—the spectroscope—is yearly and daily giving us more and more knowledge of the actual motions of the different ingredients, and of the splendid and all-important resulting phenomena.

To form some idea of the amount of the heat which is being continually carried up to the sun's surface and radiated out into space, and of the dynamical relations between it and the solar gravitation, let us first divide that prodigious number (476×10^{21}) of horse-power by the number ($6{\cdot}1 \times 10^{18}$) of square metres[†] in the sun's surface, and we find 78,000 horse-power as the mechanical value of the radiation per square metre. Imagine, then, the engines of eight ironclads applied, by ideal mechanism of countless shafts, pulleys, and belts, to do all their available work of, say, 10,000 horse-power each, in perpetuity, driving one small paddle in a fluid contained in a square metre vat. The same heat would be given out from the square metre* surface of the fluid as is given out from every square metre of the sun's surface.

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[*] Royal Institution of Great Britain.

[†] The sun warms and lights the earth by wave motion, excited in virtue of his white-hot temperature, and transmitted through a material commonly called the luminiferous ether, which fills all space as far as the remotest star, and has the property of transmitting radiant heat (or light) without itself becoming heated. I feel that I have a right to drop the adjective luminiferous, because the medium, far above the earth's surface, through which we receive sun-heat (or light), and through which the planets move, was called ether 2000 years before chemists usurped the name for "sulphuric ether," "muriatic ether," and other compounds, fancifully supposed to be peculiarly ethereal; and I trust that chemists of the present day will not be angry with me if I use the word ether, pure and simple, to denote the medium whose undulatory motions constitute radiant heat (or light).

[*] [Note of February 21, 1887.—The "paradox" referred to here, is, as I now find, merely a mis-statement (faulty and manifestly paradoxical through the omission of an essential condition) of an astonishing and most important conclusion of a paper by J. Homer Lane, which appeared in the 'American Journal of Science' for July 1870 (referred to more particularly on p. 11 below). In Newcomb's 'Popular Astronomy,' first edition, p. 508, the omission is supplied in a footnote, giving a clear popular explanation of the dynamics of Lane's conclusion; and the subject is similarly explained in Ball's 'Story of the Heavens,' pp. 501, 502, and 503, with complete avoidance of the "paradox." And now I take this opportunity of correcting my hasty correction of the "paradox" by the insertion of the five words in italics added to line 6 of the paragraph.—W. T.]

[†] A square meter is about 10¾ (more nearly 10·764) square feet, or a square yard and a fifth (more nearly 1·196 square yards). The meter is a little less than 40 inches (39·37 inches=3·281 feet=1·094 yards). The kilometre, which we shall have to use presently, being a thousand metres, is a short mile as it were (·6214 of the British statute mile). Thus in round numbers 62 statute miles is equal to 100 kilometres, and 161 kilometres is equal to 100 statute miles. The awful and unnecessary toil and waste of brain power involved in the use of the British system of inches, feet, yards, perches, or roods, or poles, "chains," furlongs, British statute miles, nautical miles, square rod (30¼ square yards)! rood (1210 square yards)! acre (4 roods), may be my apology, but it is only a part of my reason, for not reckoning the sun's area in acres, his activity in horse-power per square inch or per square foot, and his radius, and the earth's distance from him in British statute miles, and for using exclusively the one-denominational system introduced by the French ninety years ago, and now in common use

But now to pass from a practically impossible combination of engines, and a physically impossible paddle and fluid and containing vessel, towards a more practical combination of matter for producing the same effect. Still keep the ideal vat and paddle and fluid, but place the vat on the surface of a cool, solid, homogeneous globe of the same size (697,000 kilometres radius) as the sun, and of density (1·4) equal to the sun's mean density. Instead of using steam-power, let the paddle be driven by a weight descending in a pit excavated below the vat. As the simplest possible mechanism, take a long vertical shaft, with the paddle mounted on the top of it so as to turn horizontally. Let the weight be a nut working on a screw-thread on the vertical shaft, with guides to prevent the nut from turning—the screw and the guides being all absolutely frictionless. Let the pit be a metre square at its upper end, and let it be excavated quite down to the sun's centre, everywhere of square horizontal section, and tapering uniformly to a point in the centre. Let the weight be simply the excavated matter of the sun's mass, with merely a little clearance space between it and the four sides of the pit, and with a kilometer or so cut off the lower pointed end to allow space for its descent. The mass of this weight is 326 million tons. Its heaviness, three-quarters of the heaviness of an equal mass at the sun's surface, is 244 million tons solar surface-heaviness. Now a horse-power is, per hour, 270 metre-tons, terrestrial surface-heaviness, or 10 metre-tons solar surface-heaviness, because a ton of matter is twenty-seven times as heavy at the sun's surface as at the earth's. To do 78,000 horse-power, or 780,000 metre-tons solar surface-heaviness per hour, our weight must therefore descend at the rate of one metre in 313 hours, or about 28 metres per year.

To advance another step, still through impracticable mechanism, towards the practicable method by which the sun's heat is produced, let the thread of the screw be of uniformly decreasing steepness from the surface downwards, so that the velocity of the weight, as it is allowed to descend by the turning of the screw, shall be in simple proportion to distance from the sun's centre, This will involve a uniform condensation of the material of the weight; but a condensation so exceedingly small in the course even of tens of thousands of years, that, whatever be the supposed material, metal or stone, of the weight, the elastic resistance against the condensation will be utterly imperceptible in comparison with the gravitational forces with which we are concerned. The work done per metre of descent of the top end of the weight will be just four-fifths of what it was when the thread of the screw was uniform. Thus, to do the 78,000 horse-power of work, the top end of the weight must descend at the rate of 35 metres per year, or 70 kilometres per 2,000 years.

Now let the whole surface of our cool, solid sun be divided into squares—for example, as nearly as may be of one square metre area each—and let the whole mass of the sun be divided into long inverted pyramids or pointed rods, each 697,000 kilometres long, with their points meeting at the centre. Let each be mounted on a screw, as already described for the long tapering weight which we first considered, and let the paddle at the top end of each screw-shaft revolve in a fluid, not now confined to a vat, but covering the whole surface of the sun to a depth of a few metres or kilometres. Arrange the viscosity of the fluid and the size of each paddle so as to let the paddle turn just so fast as to allow the top end of each pointed rod to descend at the rate of 35 metres per year. The whole fluid will, by the work which the paddles do in it, be made incandescent, and it will give out heat and light to just about the same amount as is actually done by the sun. If the fluid be a few thousand kilometres deep over the paddle, it would be impossible, by any of the appliances of solar physics, to see the difference between our model mechanical sun and the true sun.

To do away with the last vestige of impracticable mechanism in which the heavinesses of all parts of each long rod are supported on the thread of an ideal screw cut on a vertical shaft of ideal matter, absolutely hard and absolutely frictionless: first, go back a step to our supposition of just one such rod and screw working in a single pit excavated down to the centre of the sun, and let us suppose all the rest of the sun's mass to be rigid and absolutely impervious to heat. Warm up the matter of the pyramidal rod to such a temperature that its material melts and experiences as much of Sir Humphry Davy's "repulsive motion" as suffices to keep it balanced as a fluid, without either sinking or rising from the position in which it was held by the thread of the screw. When the matter is thus held up without the screw, take away the screw, or let it melt in its place. We should thus have a pit from the sun's surface to his centre, of a square metre area at the surface, full of incandescent fluid, which we may suppose to be of the actual ingredients of the solar substance. This fluid, having at the first instant the temperature with which the paddle left it, would at the first instant continue radiating heat just as it did when the paddle was kept moving; but it would quickly become much cooler at its surface, and to a distance of a few metres down. Currents of less hot fluid tumbling down, and hotter fluid coming up from below, in irregular whirls, would carry the cooled fluid down from the surface, and bring up hotter fluid from below, but this mixing could not go on through a depth of very many metres to a sufficient degree to keep up anything approaching to the high temperature maintained by the paddle; and after a few hours or days, solidification would commence at the surface. If the solidified matter floats on the fluid, at the same temperature, below it, the crust would simply thicken as ice on a lake thickens in frosty weather; but if, as is more probable, solid matter, of such ingredients as the sun is composed of, sinks in the liquid when both are at the melting temperature of the substance. thin films of the upper crust would fall in, and continue falling in, until, for several metres downwards, the whole mass of mixed solid and fluid becomes stiff enough (like the stiffness of paste or of mortar) to prevent the frozen film from falling down from the surface. The surface film would then quickly thicken, and in the course of a few hours or days become less than red-hot on its upper surface, the whole pit full of fluid would go on cooling with extreme slowness until, after possibly about a million million million years or so, it would be all at the same temperature as the space to which its upper end radiates.

(*To be continued.*)

◆

Patent Intelligence.

Application for Letters Patent.

11,454. Edwin H. B. Lyne, 54, London Street, Fitzroy Square, London, W., for "Lyne's perfect photographic print washer." August 23rd, 1887.

Official Abstract of Accepted Complete Specification.

Leisk, 12,755 of 1886. "Rotary disc shutter with aperture shaped to give longer exposure to foreground."

Specifications Published.

12,571. William James Lancaster, of Colmore Row, Birmingham, in the County of Warwick, Manufacturing Optician, for "A new or improved pocket or portable apparatus for the taking of photographic pictures."—Dated October 4th, 1886. [Details next week.]

12,700. Benjamin Joseph Edwards, of The Grove, Hackney, London, in the County of Middlesex, Photographer, for "Improvements in machines for coating photographic plates."—Dated October 6th, 1886.

Claims details as to scraper, cooling chamber, carrying bands, and brush.

Patents Granted in America.

367,986. William H. Lewis, Brooklyn, assignor to E. and H. T. Anthony and Company, New York, N.Y., for "Photograph-camera shutter."—Filed April 30, 1886. Serial No. 200,661. (No model.)

Claim.—1. The combination, with the oscillating shutter D, provided with the notches *l m*, and the projecting portion intermediate between the notches, of the lever G, provided with arms *u v*, arranged to be received in the notches in alternation, the notch *l* being shorter than the notch *m*, as herein specified.

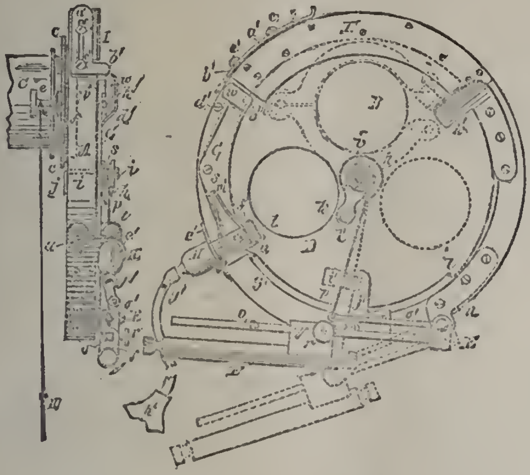
2. The combination, with the shutter D, provided with notches *l m*, and the weighted lever E, of the lever G, provided with the arms *u v w*, and the plate a', having the finger b' for limiting the motion of the lever G, substantially as herein shown and described.

3. The combination, with the shutter D, provided with notches

---

in every civilised country of the world, except England and the United States of North America. The British ton is 1·016 times the French ton, or weight of a cubic metre of cold water (1016 kilogrammes). The French ton, of 1000 kilogrammes, is ·9842 of the British ton. Thus for many practical reckonings, such as those of the present paper, the difference between the British and the French ton may be neglected.

l m, and the weighted lever E for moving the shutter, of the lever G, provided with arms *u v t*, and the pneumatic cylinder H, having the piston *f′* arranged to engage the arm *t*, and the V-shaped spring *m′* arranged to oppose the action of the piston *f″*, substantially as shown and described.



4. The combination, with the shutter-body A, provided with the opening B and annular groove *a*, of arms *c* and means, substantially as shown and described, for clamping the arm in a closed position.

Correspondence.

THE HYPOCHLORITE REDUCER.

Sir,—Mr. Ralph W. Robinson having in your last issue renounced all claim to the introduction of the hypochlorite methods of reducing intensity, I should be content to leave the matter without further comment, but for his suggestion that my reclamation was unnecessary. When, however, a method is published as presumably new, it seems to me that there is nothing captious in the originator of that method writing to give the date of his earlier publication, and indeed he must do so unless he is content to allow the process to be attributed to the re-discoverer.—Yours,

W. E. Debenham.

DUBLIN PHOTOGRAPHIC EXHIBITION.

Dear Sir,—May I remind intending exhibitors that the time for sending in their contributions is now approaching, 15th October being the last day on which pictures, &c., can be admitted?

Prospectuses, entry forms, &c., can be obtained on application to the undersigned—

Greenwood Pim,
Hon. Sec. Exhibition Committee,
Monkstown, co. Dublin.

THE NORTH LONDON SOCIETY.

Dear Sir,—I wish to call your attention to an error that has crept into your report of the proceedings of the North London Photographic Society, and which please correct in your next issue. I am made to say that "I only used two stops—$\frac{f}{32}$ and $\frac{f}{64}$." What I did say was, "I thought two stops were sufficient for general work—*No.* 16 *and No.* 64 *U.S.*," which makes all the difference.—I am, sir, faithfully yours,

E. Dunmore.

Beacon Hill, N., August 26.

[The report complained of was furnished by the secretary's representative.]

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on the 25th ult.; J. Traill Taylor occupied the chair.

The Chairman exhibited negatives illustrating his remarks concerning mixed soda and potash development, and proved that old plates known to fog could be successfully developed with such a developer as the one he mentioned at the previous meeting (see page 543).

H. M. Smith drew attention to the exceeding lightness of an improved Eastman roll-holder he had just purchased. When charged with a spool of paper sufficient for forty-eight whole-plate negatives, the weight was under two and a quarter pounds.

A. Jackson explained the nature of the improvement in the Eastman holder. The metal frame was not used, but tension gained by means of internal springs. There was also a new indicator, not dependent upon the human ear.

Bracher's automatic distilling apparatus was shown by A. L. Henderson. The internal structure resembled an inverted funnel, but an improvement upon this old method is supposed to be gained by the form of tube (not a worm) which passes through a section of the apparatus. It was said that so efficient did it work, that a boiler containing two quarts of water would yield one quart of distilled water per hour.

Lightning photographs by Joseph Gray, Newcastle; a flight of gulls, Benjamin Wyles, Blackpool, and others of less interest, were passed round for inspection.

Ernest G. Dornbusch was elected a member.

The meeting then became special, to discuss the proposed amended rules.

Liverpool Amateur Photographic Association.

The usual monthly meeting was held on August 25, at the Royal Institution, H. Rutter in the chair.

W. A. Watts opened the discussion on Mr. Beer's paper on slow development. He quite agreed with slow and tentative development, having practised it in his own work, but he had not previously tried the developer recommended by Mr. Beer, namely, the American Standard Developer, which, he said, many persons confused with Beach's. He worked Eastman paper exclusively, employing first the Eastman soda formula; not liking the working of that, he tried carbonate of potash, using it proportionally to the carbonate of soda. Although he had read of the American Standard or ferrocyanide developer, he had not thought it could surpass the potash one until he saw Mr. Beer's negatives; but, being much struck with their beauty, both for gradation of density and freedom from stain, he had made up some ferrocyanide developer, and tried it with very great satisfaction and success. He no longer needed to use clearing solution, as the films were quite free from stain, and he recommended those present who had not yet given this developer a trial to do so.

Mr. Beer had heard that some persons found the American Standard Developer to stain; he thought that when that was the case it might arise from the omission of the sulphite of soda.

Mr. Rutter had thought that the ferrocyanide developer was not suited for Eastman films, and he pointed out that in the Eastman instructions for stripping films they direct that not more than six of sulphite of soda must be used to one of pyro, whereas Mr. Beer's formula gives four ounces of a ten per cent. solution, or one hundred and ninety-two grains of sulphite of soda to six grains of pyro.

B. J. Sayce said that if a plate was duly exposed there was no difficulty in development, but if under or over exposed then came the difficulty, and that was intensified by the fact that we work out by seconds and fractions of seconds where the older processes took minutes; if, for instance, the correct exposure was one one-hundredth of a second, and we gave only one two-hundredth, that was a large amount to pull up, but it might be done by slow development. He generally gave slow development—half an hour on an average—but one of the interior of Speke Hall took an hour. As an encouragement for patience in slow development, he had given, when using the shortest exposure on collodio-albumen plates, as much as a week in development.

J. H. Day said as American development had many advocates he would speak in favour of the older Swan method coupled with slow development. He used one drachm of ammonia and one drachm of bromide of potassium in ten ounces of water, dissolving dry pyro in an equal quantity of water, using ounce for ounce of solution, but beginning with only one-third of the quantity of ammonia solution, and adding the remainder as development progressed.

Birmingham Photographic Society.

The usual monthly meeting was held in the Technical Schools, Bridge Street, on the 25th inst., G. A. Thomason in the chair.

Messrs. Greening, Copnall, Hulton, and Venour were elected members.

The Hon. Secretary (Mr. Pickard) read a letter from Mr. Karleese relinquishing the co-secretaryship on account of pressure of business and ill-health. A number of the members having spoken with regret of this loss to the Society, it was resolved unanimously that the best thanks of the Society be given to him for his past valuable services, and hoping he would soon be able again to render his great help and assistance.

W. Rooke was elected to the vacant co-secretaryship.

A number of photographs, taken during the holidays by Messrs. Harold Baker, Leeson, Godfrey Thomasson, Tylar, and Pickard, were exhibited.

S. Delicate read an instructive paper on "Out-Door Photography" (see page 556). A discussion followed.

C. Tyler read his report of the excursion to Tintern and Symond's Yat on August 1st last, in which it was stated that a considerable number of views were taken at Symond's Yat, one not having to wander far to obtain them. The ancient ruins of Tintern Abbey were found admirably suited for picture making, both exterior and interior giving numerous effects of light and shadow. The number of plates exposed was 113.

H. T. Welford gave a short paper on "The Wants of Amateurs," and exhibited a detective camera (German), with which he had had considerable success, and the meeting terminated with the announcement of the paper for Sept. 22—"Stripping Films," by E. H. Jacques.

Talk in the Studio.

The Eclipse in Eastern Russia.—Some of the German papers publish short notes about the eclipse which have reached them from Siberia and various stations in the Russian eastern provinces. At Tomsk the astronomers were able to observe not only the total eclipse, but the corona, in a very satisfactory way. In most houses it was necessary to light candles or lamps. The eclipse began at 10.22 a.m., and ended at 11.46. The weather was very fine, and the sky clear. At Krasnoyarsk, in the government of Yeniseisk, the corona was very well photographed. At Irbit the period of absolute totality was at 8.44 a.m., and lasted 1½ minute. Professor Stangevich, from Belgrade, was very successful in his observations at Petrovsk; he saw and photographed the green line in the corona. Professor Kokonovich, of Odessa, was equally fortunate, obtaining photographs of the whole spectrum. At Ekaterinburg the eclipse began in a cloudless sky at 7·25 a.m., and lasted till 9.30. The temperature fell from 19° Centigrade to 13° (about 55½° Fahrenheit) at 8.37 a.m., and rose to 24° (over 75° Fahrenheit) after the eclipse. At Novocherkask the sky was cloudless, but only about a quarter of the sun's surface was obscured, the appearance presented being a reaping-hook with the handle and point uppermost. Photographic sketches were taken every five minutes. At Savidovo the sky became suddenly clouded as the moment of the eclipse approached, and the sun was not visible till noon. The actual moment of the total eclipse could only be noted by the intense darkness which suddenly spread over the whole district. Here and there a yellowish or leaden-grey tint could be distinguished in the clouds, presenting a most weird appearance; and the strangeness of the scene was heightened by the profound disquiet and fear which seemed to have taken possession of the birds and the cattle in the fields.—*Times.*

The British Association.—The fifty-seventh annual meeting was opened at Manchester, on Wednesday last; Sir Henry Roscoe, the President, delivering the inaugural address. He referred to the present state of the atomic theory, and said that Loschmidt, of Vienna, had come to the conclusion that the diameter of an atom of oxygen or nitrogen was the ten millionth part of a centimetre. With the highest known magnifying power we could distinguish the forty-thousandth part of a centimetre; if, now, we imagined a cubic box, each of whose sides had this length, such a box, when filled with air, would contain from sixty to a hundred millions of atoms of oxygen and nitrogen. As to the indivisibility of the atom, the space of fifty years had completely changed the face of the inquiry. Not only had the number of distinct, well-established elementary bodies increased from fifty-three in 1837 to seventy in 1887, but the properties of these elements had been studied, and were now known with a degree of precision then undreamt of. Had the atoms of our present elements been made to yield? To this a negative answer must, undoubtedly, be given, for even the highest of terrestrial temperatures, that of the electric spark, had failed to shake any one of these atoms in two. This was shown by the results with which spectrum analysis had enriched our knowledge. Terrestrial analysis had failed to furnish favourable evidence; and, turning to the chemistry of the stars, the spectra of the white, which were presumably the hottest stars, furnished no direct evidence that a decomposition of any terrestrial atom had taken place; indeed, we learned that the hydrogen atom, as we know it here, can endure unscathed the inconceivably fierce temperature of stars presumably many times more fervent than our sun, as Sirius and Vega. It was, therefore, no matter for surprise if the earthbound chemist should for the present continue to regard the elements as the unalterable foundation stones upon which his science is based.

Photographic Club.—The subject for discussion on September 7, will be "Dark Room Arrangements." Saturday outing at Carshelton; train from Victoria near 2 o'clock.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

C. D.—Make the gelatinous solution rather stronger, and keep it near the boiling point for ten minutes before using.

Robert F. Dixon.—Print in a bright light, and use a chloride of lime bath. The formula is given on page 202 of the Year-Book.

H. S. G.—There is nothing to choose between those you mention, but we should recommend you to go to one of the high-class opticians.

Chas. Pocock.—The information you give is very interesting, and we shall make use of it in due course.

J. B.—A solution made very slightly acid, and diluted with water until about the colour of sherry, is the proper thing to use, and after rinsing the negative, it should be immersed for a short time in one part of citric acid and ten of water. Wash well before drying.

C. and E. Hill.—A trace of hypo has probably been carried into the toning solution.

Lex.—If anywhere, you can obtain them at Mrs. Evans' photograph shop in Duncannon Street, close by Charing Cross Station.

W. Mountain.—The matter is dealt with in a note we have sent you.

J. M. Marks.—We can only suppose that the solution has undergone partial reduction, or that the original salt of iron used contained some proto-salt.

C. N. T.—Probably Abney's "Instruction" will suit you best. It is not an expensive book, and is published by the same firm that publishes the Photographic News.

R. Marrison.—1. We can easily make sure as to what he wrote, but probably we shall never know what it was that he really meant. 2. A moderately strong solution of shellac in methylated spirit is the most convenient thing to use.

B. R.—If nitric acid does not remove it, try a mixture of bichromate of potassium and sulphuric acid—one part of the former, two of the latter, and ten of water.

Liberator.—A reader merely wishing for information need not use his real name; but unsigned letters are not admissable.

Gum.—Quite useless for the purpose, as the film would dissolve in the solution.

H. A. G.—There is no work in the English language with complete directions for the process; you can, however, find in the earlier volumes of the Photographic News, all the information you require.

Thos. Burrell.—From what you say we are inclined to think that one of the glasses has been lost, and the place filled with something quite useless. Take it to the opticians whose name it bears.

⁂ Several Answers are unadvoidably postponed till next week.

THE PHOTOGRAPHIC NEWS.

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PATENT OFFICE LIBRARY

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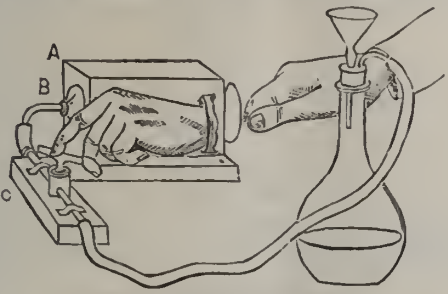
SOME NOVELTIES IN CHEMICAL APPARATUS.

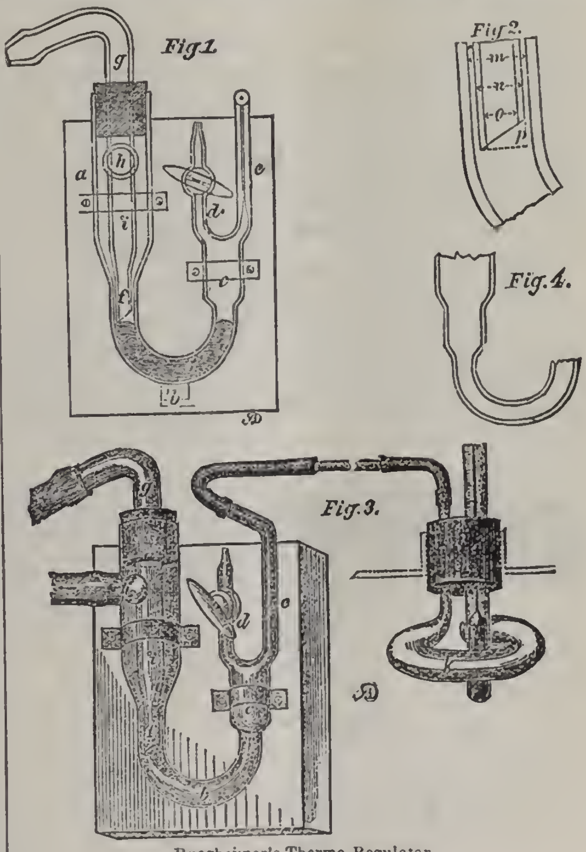
The photographic experimentalist is ordinarily by no means slow to avail himself of the improvements which are constantly being made in laboratory appliances, and to enable him to satisfy his desire of using the latest and best we now describe some contrivances which should prove useful in the photographic laboratory.



Latham's Quick-Filtering Apparatus.

A Quick Filtering Apparatus.—The arrangement illustrated below is described by Woodville Latham in the *American Chemical Journal*, and is thus described by him:—"The accompanying cut represents a quick-filtering apparatus, devised by the writer some four or five years ago, and which, in the absence of a head of water, answers fully all the purposes of the Bunsen pump. B is an ordinary hard rubber syringe, five inches long, fixed in a block, A (which is a piece of pump stock with a bore to suit the diameter of the syringe and screwed to the table); and C is a three-way stop-cock worked with the left hand, while the right hand works the piston of the syringe." The funnel should be fitted to the flask by means of an india-rubber cork, and a cone of platinum foil should be used to support the filter paper when paper is used as a filtering medium.

A Practical Thermo Regulator.—The instrument of Ruegheimer has been in use for a number of years in the laboratory of the university of Kiel, and the following description is translated from the Berlin *Berichte*, in the *American Druggist*:—



Ruegheimer's Thermo-Regulator.

The apparatus consists of a thick-walled glass tube *a*, *b*. *c*, of the shape shown in the cut. The expanded portion at *c* terminates in two branches, one of which contains the glass stop-cock *d*, while the other consists of a thick-walled tube *e*. At *h*, a lateral tube is fused upon *a*. The upper wide-neck is closed with a tight stopper, through which passes a glass tube, which is connected, by rubber tubing, with the gas supply. The tube *h* leads to the burner, and the tube *e* is connected, by means of very stout and narrow-bored rubber tubing, with an empty glass vessel (a flask will answer, but the author seems to prefer the glass coil shown in the cut) situated within the hot-air chamber. Fig. 1 shows the principal part of the apparatus in section. Supposing the stop-cock *d* is opened, thereby establishing communication between the outer air and the interior of the air-expansion vessel *k*. If the supply of gas is turned on, it will enter at *g*, pass through the inner tube, and issue at the obliquely cut-off orifice *f* over the surface of a small quantity of mercury contained in the lower part of the U-tube. It will ascend in the interval between the two glass tubes *a* and *f*, and pass out through *h*, whence it will be led to the burner (not shown on the cut). As long as the stop-cock *d* is kept open, the apparatus will not affect the supply of gas in any way. When it is closed, however, the air expanding in the glass vessel cannot find its way any longer into the outer air, but will gradually depress the column of mercury in the limb *c*, until the orifice *f* in the other limb will be closed. The supply of gas would then cease entirely were it not for a small hole at *i* (in the inner tube), through which a sufficient quantity reaches the burner to prevent the flame from going out altogether. As soon as the temperature of the air chamber falls a little, the mercury will recede from the orifice *f*, and the gas supply be re-established. The terperature at which the apparatus is to act may be regulated by pushing the inner tube *g*, *f* further up or down.

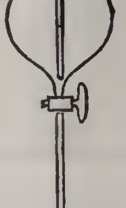
As it is of some importance to preserve certain definite proportions between the different parts of the apparatus, the author appends specific directions.

The length of *p*, representing the pitch of the obliquely cut-off orifice *f*, ought to be equal to half the diameter of the tube at *n* (see fig. 2). The diameter *m* of the outer tube *b* is to be selected so that the area of the passage between the inner and the outer tube is as nearly as possible equal to the area of the bore *o* of the inner tube, so that the current of gas issuing from *f*, when this is uncovered by mercury, will pass between the tubes without alteration of pressure. The air-expansion vessel within the hot-air chamber should be chosen of as large a calibre as possible.

The particular apparatus described by the author consists of an air bath for heating glass tubes close by fusion. The air reservoir (*k*) has an internal capacity of about 350-360 C.c., and consists of a thin-walled glass tube bent in form of a ring, closed at one end by fusion, and terminating at the other in a thick-walled tube of not quite 1 millimetre bore. This is connected by a very strong rubber tube with the tube *e* of the same narrow bore. The tube *f* has a diameter of 5 millimetres at *o* (fig. 2), and its walls are 0·75 millimetres thick. The tube *b* has a diameter *m* of 8½ millimetres.

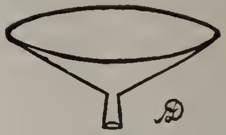
If the temperature in the beginning, after starting the apparatus, should rise too high, the stop-cock *d* is opened, and the supply of gas shut off altogether until the temperature has fallen sufficiently. Whenever the gas is turned off entirely, the stop cock *d* must be opened to prevent the mercury from being respirated towards the air reservoir.—After *Ber. d. Deutsch. Chem. Ges.*, 1887, 1,280.

Pollack's Dropping Funnel.—This consists of a funnel, having a hollow stopper extending to a tube, and a small inlet tube attached to the neck of the funnel, which can be made to communicate with the bore of the stopper so as admit the air. If the stop-cock below is opened, and the stopper suitably turned, the contents of the funnel may be made to escape at any desired rate of slowness. The air to be admitted into the funnel may first be passed through wash or drying bottles, or some indifferent gas may be admitted in place of the air.



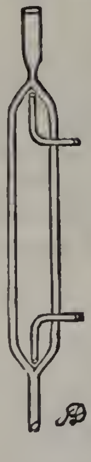
Pollack's Dropping Bottle.

Funnel for Powders.—The subjoined figure represents a flat funnel made of black cryolite glass. It is intended for introducing powders into flasks or other apparatus, for which purpose glazed paper has generally been used. The expanded neck prevents choking of the latter.



Funnel for Powders.

A New Condenser.—Pollack describes a condenser in which the jet of cold water is made to impinge upon the hottest part of the interior, thereby insuring the most effective cooling of the vapours. It is represented by the subjoined figure.



Pollack's Condenser.

THE CORNWALL POLYTECHNIC SOCIETY.

The following is a list of the awards made in connection with the exhibition just opened.

Silver Medals First Class.—W. J. Byrne, F. A. Green, H. P. Robinson.

Silver Medals Second Class.—W. H. Hyslop, J. Lafayette, B. Wyles.

Bronze Medals.—Dr. E. W. Alabone, Warwick Brookes, F. B. Dagley, G. Davison, W. J. A. Grant, Rev. H. B. Hare, Morgan and Kidd, F. Whaley.

Highly Commended.—J. M. Brown.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter XI.—Cameras—The Body—The Front—The Back—Methods of Focussing—Focussing Screens.

The only photographic apparatus that it is proposed to consider, are cameras, lenses, and a few of their commonest adjuncts; and it will be necessary to deal with principles rather than with the particular forms of apparatus that have been constructed, or are now offered for sale, because a discussion of the many modifications that have been made would demand a course of lectures to itself.

Camera bodies are most often made of the bellows form, and this has not only the advantage of portability and ease of focussing, but the light transmitted by the lens that impinges upon the walls of the camera is reflected forwards or across the camera rather than on to the sensitive plate. Sliding-body cameras, whether of the old form, or with more than one draw, as in Stanley's telescopic camera; and solid body cameras, whether they fold like the old-fashioned instruments, or are rigid as in some patterns of detective cameras, allow the light that impinges upon their flat slides to glance off on to the sensitive plate, especially at its edges. This should be guarded against by diaphragms fixed at regular intervals within the camera, with rectangular openings large enough to allow light from every part of the lens to reach every part of the sensitive surface. A less efficacious method is to line the chamber with black velvet, and so reduce the reflection from the sides as far as possible, instead of doing away with it altogether.

That part of the camera that carries the lens is always spoken of as the camera front. It is often necessary to raise the lens to get the upper part of a high building on to the plate, or to reduce the extent of foreground; and occasionally it is required to lower the lens when the photographer is obliged to occupy a higher standpoint than he would prefer. The camera front, therefore, ought always to slide upwards—say two inches or more for a whole-plate camera—and it is well if it will slide downwards about an inch for this size. A horizontal movement of the lens is very rarely desirable, unless only a part of the sensitive surface is to be exposed, and the lens is wanted opposite that part; but if the camera is constructed so that it must be turned on its side for pictures taken with the longest direction of the plate vertically, then what is usually in landscape work the horizontal movement of the front becomes a vertical movement, and is a necessity.

Any movement of the lens that places its axis at other than a right angle with the focussing screen is to be guarded against. It is a waste of workmanship to attach the lens to a ball-and-socket arrangement, as has been done, and the notion that a swinging front is in any way a substitute for a swinging back is erroneous. However the back swings, the lens, in its normal position, points to the centre of the sensitive surface; but the front cannot be swung in any direction without upsetting this condition. A front that swings vertically is, however, useful in conjunction with the vertical swing of the back if the front and back are kept parallel; as the effect produced is that of an abnormal amount of rise or fall of the front, this is especially to be commended where the front is small, and the principle is well shown in McKellen's camera and its many imitations.

To do good work under ordinary varying circumstances, the back frame of the camera must swing vertically (that is, like a toilet-table looking-glass). even with the smallest of cameras. This is admitted by probably every maker; but the equal importance of having some means of knowing when the back frame is vertical is not recognized by any camera maker that the writer is acquainted with. It is true that anyone can carry a spirit level. but this is a lame and troublesome substitute for a level fixed to the camera itself. It is important to notice that the level is for the purpose of indicating when the sensitive surface is vertical, and it is therefore preferable to fix it to the back frame of the camera; and a round level is more convenient and compact than two straight levels at right angles to each other. The vertical swing is used to keep the sensitive plate vertical when the camera is tipped in taking architectural subjects, that the vertical lines, as produced in the picture, may not converge. This movement of the plate throws the top and bottom of the picture out of focus, for the nearer the object is, the further off is the image from the lens, and the movement of the plate necessary to keep the vertical lines true brings the upper part of the sensitive surface nearer the lens, and it is this part that receives the image of the nearer part of the object. Thus definition is sacrificed for correctness of form, and to restore the lost sharpness a small stop must be used. If the swing-back is used in the other direction—that is, drawing the top part of the plate away from the lens—focussing is made easier, because the near foreground is delineated on the surface further from the lens; but this use of the swing-back always distorts the picture, producing a perpendicular convergence that includes an undue proportion of the upper part of the subject. This aid to focussing is occasionally useful in skilled hands, but is never necessary except when large plates are employed.

The horizontal swing is exactly comparable to the vertical swing used in the manner last described, and accordingly introduces distortion for the sake of ease in getting definition without having recourse to so small a stop in the lens as would otherwise be necessary. It is used in focussing a row of houses, trees, &c., that recede from the camera, but it has the very undesirable effect of dwarfing the distance, and so giving a similar result to a lens of shorter focal length used at a point of view nearer the subject photographed.

Better advice cannot be given to the outdoor worker than to keep his plate perpendicular and the lens axis at right angles to the plate, and to use the possibilities of deviating from these rules to the very least extent.

It is preferable to have the swinging centres so fixed that their axes cross at the centre of the plate; but it is often worth while surrendering this point for the sake of the portability that can be obtained by adjusting the back frame of the camera on the hinges at its lower part that also serve for closing the apparatus for carriage.

The contrivance for holding the sensitive material, technically called the "back," has been modified in a great number of ways, but the well-known book form of double back continues to be the most popular, in spite of its defects and its competitors. Perhaps its chief defect is its great cost when constructed in a thoroughly reliable way, but no cheaper form appears to be so good and convenient. A metal double-back is now on the market, and this appears to be a step in the right direction. If metal backs were made by suitable special tools, so that all those of one size were the exact reproductions of each other, we should have the great advantage of cheap backs, and proof against damage by exposure or wet.

The Americans are far in advance of us in this matter, for they have uniform guages, so that any maker's back will fit and be in register in any maker's camera of the same size. With our present system of every maker for himself, it seems hopeless to imagine that the first cost of making the necessary tools for constructing uniform backs in metal of the various sizes would prove a profitable investment, as the number of cameras that such slides would fit would be very limited. The weakest parts of camera backs, so far as concerns the exclusion of light, are the openings where the slides are drawn out. If the back could be adjusted to the camera so that its slides were drawn downwards, the possibility of light gaining access to the sensitive plate would be very much reduced. When a double-back is opened for the removal of its plates, the plate that is at once exposed to view should always be the one indicated by the lower figure, that is, the odd number; variety in this respect, which makers seem to think charming, means confusion and loss of time to the user.

The rotating back carrier is a more useful arrangement than the usual reversing back, if it is made with exactness; but a greater weight of material is necessary in its construction, and probably most people would consider this drawback to more than outweigh the small advantages possessed by this pattern of camera.

Changing-boxes are, by universal consent, condemned as inferior to double backs; these, therefore, and roller-slides, which have been so recently and fully discussed, we shall pass by.

For focussing the image it is necessary to be able to alter the distance between the lens and the sensitive surface easily, smoothly, and exactly, and yet to retain the part moved with sufficient firmness to allow of the subsequent operations. Cameras for copying and indoor work in general are preferably made with the front fixed, and the back part to move, because the distance between the object photographed and the lens determines the size of the image produced, and it is very inconvenient to be unable to adjust the distance of the focussing-screen from the lens without altering the distance between the lens and the object, and therefore the size of the reproduction. But in landscape work the distance of the nearest object from the lens is so considerable that an inch or so more or less makes practically no difference, and we may, therefore, focus by moving the camera front without disadvantage. This latter method also has much to recommend it, for cameras constructed on that principle can be made lighter and more compact, which is an important consideration with the photographer who cannot employ a porter, and the back frame of the camera being fixed it cannot be jarred from its proper position by the introduction of the dark slide, &c. This last advantage is the more important, because apparatus used out of doors is more likely to work irregularly than apparatus used only in the studio, as it suffers somewhat by exposure.

Focussing is generally done by means of a screen of ground glass. Ordinary ground glass is almost useless for the purpose, because the grain is too coarse to allow the details of the picture to be seen, and the finest ground surface that can be obtained will not permit of the sharp focussing desirable in copying subjects done in lines like engravings. For this purpose no screen will answer; the actual image itself must be employed in focussing, and to know whether the image is produced in the proper plane, a sheet of transparent glass that has its front side marked with very fine lines is introduced in the place of the ordinary focussing-screen, and a good focussing lens is adjusted so that the lines on the glass, as seen through the lens, are as sharply defined as possible. It only remains to get the image of the object before the camera at its maximum sharpness; for if the lines on the glass and the image are simultaneously sharp as seen through the same lens, they must be in the same plane. It is stated to be preferable to have the lines on the glass in groups, with an interval between the groups.

To get the advantage of this method of focussing without interfering in any way with the utility of the ordinary focussing screen, it is only necessary to cement two or three thin microscopic cover glasses to the focussing screen by means of Canada balsam, after having drawn a few pencil lines on the spaces where the cover glasses are to be attached. It is convenient to put one in the middle of the screen, and one or two at the corners. The balsam entirely obliterates the dullness of the glass due to the grinding, and leaves only the pencil marks visible.

An excellent focussing screen can be made by exposing an ordinary dry plate for a short time, and then developing it until it is uniformly and sufficiently grey, fixing, and drying. A suitable degree of opacity is thus obtained without the irregularities of necessity present when the opacity is due merely to roughness of surface. A focussing screen that shows no grain, even when magnified eighty diameters, can be prepared by inducing red fog in a gelatine plate. This is readily done by applying a ferrous citrate developer made alkaline with ammonia, and then fixing in the ordinary way. Coloured glass does not appear to be a sufficient barrier to the light to make visible the image that falls upon it, though one might imagine that glass flashed with a colour on one side would be very similar to the glass with the coating of fogged film.

(*To be continued.*)

A LADY PHOTOGRAPHER.

She knew all about photography, so she said. "She," in this instance, let me hasten to say, had nothing mysterious about her. Her eyes did not "shine with a baleful light," her cheeks were not "drawn and white," a sinister smile did not "play about her lips," her hair had not the "glint of molten gold," nor was it as "black as the raven's wing;" in fact, in no way did she correspond to any of the types of heroine which the fervid imagination of the romance writer is so apt to picture. She was a very quiet looking young person, neatly and plainly dressed, with a prosaic, business-like expression upon her face, and did not in the least look as if she had a "history."

We were at the railway station of a certain out-of-the-way country town. She had missed the train to London, and there was not another for an hour. I had just arrived from London, and as one of the very heavy showers with which we have been favoured of late was falling, I preferred to wait awhile in preference to getting wet. After I had read the advertisements and glanced at the printed texts hung up in the waiting-room for the purpose, I suppose, of comforting the unfortunates who have to wait for trains, I sauntered back to where I had left my apparatus. Here I found her looking at the camera, not with the usual wondering curiosity of the uninitiated, but with an air calm and critical.

"Going photo-ing?"

I admitted I was. It was my annual holiday, and I had taken my camera with me.

"What plates do you use?" was her next query.

I was somewhat staggered by the inquiry. The young person was evidently a professional. The confident way betokened absolute knowledge, and the consciousness of being an authority on the subject could not be mistaken.

"Oh, Smith's, generally."

"Ah, you should try the 'Kidderminster.' Always make splendid 'negs.'"

"I beg your pardon," said I, interrogatively, 'Negs?"

"Yes, negatives, you know. I always use 'Kidders.'"

"Then you are a photographer?"

"Rather. I know all about photos—tinting, spotting, operating, working up negs., everything. Have been used to a much bigger cam than that."

"Cam?" I repeated, doubtfully.

"Camera, of course. What devil do you like best?"

I started. She evidently saw the look of amazement on my face, for she added: "Developer, I mean."

Pyrogallic, I hastened to say, was my weakness.

"I like the oxy best; the pie's such a bother to make."

I was beginning to understand the young person's professional abbreviations, and admitted the shortcomings of the pie.

"How do you get on with printing?" she next enquired.

"Fairly well, but I find a difficulty sometimes in toning."

"Don't see why you should. I always use the acey bath, but I'm very particular about the hyp bath. If you don't have the exact quantity of hyp—if it's a little too strong, you know, it takes all the colour out."

The young person certainly was very experienced. I understood what hyp meant, but "acey" puzzled me.

"Acetate of soda," she explained. "You'd hardly believe it, I dare say, but I was in charge of one of the largest businesses in —— (naming an important town in the Midlands), and used, as I said, to do everything. Just now I'm out of a sit."

"Out of a sit?" I murmured.

"A situation. I was in one in London for about three months, but I couldn't stand it any longer. Why, I spotted, mounted, tinted, worked up the negs, sometimes opped in the stu, kept the —"

"One moment," I interposed, somewhat perturbed, "I don't quite follow you. Did I understand you to say you hopped in the stew? You'll pardon me for enquiring; I'm afraid I'm not up in technical expressions."

"Operated in the studio; don't you understand? Well, when you have to do all this, and burn the photos into the bargain, why—"

"Good gracious!" I exclaimed, involuntarily; "burn the photographs? What on earth was that for—to get the silver out of them?"

"Of course not. Burnish the photographs. You know what burnishing means, surely."

A light broke in upon me.

"Oh, certainly. Well, you had to burn the photos, then."

"Yes, and keep the books, and all for fifteen shillings a week. As I had to live out of the house and keep myself, I got sick of it at last, and gave him notice"

"And have you got another sit.?" I enquired, thinking it best to adopt her phraseology.

"No; I've been looking out for one, but they seem dreadfully scarce. If I only had a little money I'd open a stu. myself. I believe I could make it pay. To tell you the truth, that's what has brought me to this place. I have an aunt who lives down here, you know, and she's pretty comfortably off, so I thought I might coax enough out of her."

"And have you succeeded?"

"Well, not quite. You see, aunt only knows the profession as it used to be. 'Them nasty, messy phottoes,' she calls us. I tried to make her understand the difference between col. plates and gel. plates, but, of course, it wasn't much use. But I think she'll come round after a bit. Still, I've got to live meanwhile."

"Quite so; and how do you manage it, if the question is not a rude one?"

"Oh, I've saved a little, and, with some tinting work, I just manage to make both ends meet; but it's wretchedly paid."

Indeed; how much do you get?"

"Oh! scarcely enough for my 'bus fare. They pay fourpence each for cabs, and—"

"Cabs?" I echoed in wonderment, "I thought you mentioned 'busses."

"Cabinets, I should have said; and twopence each for cartes."

"And how long will a cabinet take you to do?"

"About a quarter of an hour; but I don't have enough to make it worth while always sticking at it. No; I believe if I opened a stu. I should do well. I could manage the whole thing. Why, I once made a cam. with a spectacle glass and a big pill box, and took a photo with it."

Truly a wonderful young person.

"Yes. You see, a lady photographer, I think, ought to have plenty of business with children, and—but here's the train. If you know anybody who wants an assistant, I should be glad to take another sit. while I'm waiting for aunt's money. Good morning."

And the young person, in the most business-like manner, went up to the train, got in a carriage, and I saw her no more.

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.*

VI.—Exposing Slides by Contact.

This is by far the easiest method of making lantern sildes, and gives excellent results. When a number of negatives have to be printed from, it is best to expose a number of lantern plates at one time until all are exposed, and put them away in the dark room until they can be developed. This will be found a much better plan than that of alternate exposure and development, as, by attending to one operation at a time, both exposure and development are certain to be better done than when operations are mixed up in an unsystematic manner.

Several printing frames of quarter-plate size should be provided, and care should be taken that the backs have not the nasty habit of slipping when the springs are fastened down, which would often spoil an otherwise good slide. Larger frames *may* be used, but are very inconvenient in practice; and as small printing frames are now sold at such a cheap rate, there is no reason why the amateur should not include a dozen or two in his outfit.

Place the sensitive plate, whether chloride or bromide, with the film side next the negative. Be careful of this, as experienced operators, when working in the wretched light given out by a deep-ruby lamp, have been known to place the plate in the frame wrong-side up; so do not use a ruby lamp at all, but have one giving a subdued yellow light—either yellow glass, or two or three thicknesses of ruby fabric. Gelatino-chloride plates may be put in the frames by naked gaslight if the operation be done quickly, and the gelatino-bromide plates made for lantern work may be safely adjusted in the printing frames, and also developed, by yellow light; there is no fear of fog.

When the plate has been correctly adjusted on the negative, place on the back of the frame, and take care the plate does not slip from its position, which it will be likely to do if a larger printing frame than 3¼ inches square be employed.

It saves time and labour to fill a number of frames with plates, and expose them all at one time, whether they be chloride or bromide. As daylight is so variable, and, in the case of bromide plates, too rapid, to give satisfactory results, it is advisable to use only artificial light. When chloride plates are to be exposed, arrange them on a table in a semicircle, and burn two or three inches of magnesium ribbon about one foot away from the frames; but, for this method, the negatives should be of pretty uniform density. If they vary much, it is better to expose the denser ones separately, and give them longer exposure. A paraffin lamp may be used, but is not satisfactory with chloride plates, and as magnesium ribbon is now so cheap, it will be found to answer better than any other source of illumination. To avoid burning the fingers and wasting the magnesium, the piece of ribbon should be passed through a metal tube of about one-eight inch bore. About half-an-inch ought to protrude at the further end; as soon as this is lit (preferably in a small spirit lamp), a couple of inches more must be gradually pushed through at the rate the magnesium burns until sufficient exposure has been given. One hint is useful: *don't* perform this operation on a table covered with a good table-cloth; pieces of burning ribbon are apt to fall off, and damage the cloth and the evening's enjoyment.

For exposing slides on gelatino-bromide plates, a good paraffin lamp will be found the best instrument. It should not be a tiny affair, or one of the wretched cheap lamps now so common, which come to pieces in a short time, and are often so badly made as to be really dangerous. All the accidents, unfortunately so frequent, in the use of paraffin, are caused by cheap lamps and bad oil. So provide a well-made, plain, duplex lamp—one of the tin lamps made for hanging on walls will answer every purpose—and fill it with the best paraffin procurable.

As bromide plates cannot be handled in the same leisurely manner as chloride plates, the mode of exposure must differ. By a subdued yellow low light place the plates in the printing-frames, and as the frames are filled, place them in a pile on a table in the dark room, in pairs, face to face. Let the denser negatives occupy one pile, and the thinner ones another. Have the paraffin lamp in another room from which all light has been excluded, and let the wicks be turned down as low as possible. When all the frames are loaded, carry a pile into the room where the lamp has been placed. Put down the pile of frames on the table, and turn up the lamp wicks. Then take the top pair of frames off the pile quickly, and expose them to the lamp at a distance of twelve inches. Five seconds will suffice for a moderately dense negative, using Fry's transparency plates, while two seconds, or even one, will be ample with thin negatives. If the negatives be unduly thin, fair results will frequently be gained by exposing the frame further off, say two or three feet; but, as a rule, dense negatives make the best slides.

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* Continued from page 582.

As each pair is exposed, clamp the frames together, face to face, place them on the floor, and expose a fresh pair, until all the frames are exposed. This work may be done with great rapidity, as several dozen frames can be filled and exposed in an hour. When all the pile has been exposed, turn the lamp down and take the frames into the dark room. The exposed plates can be stored away in a light-tight box, which, for further security, may be placed in a larger box, or in a drawer, in the dark-room, until it is convenient to develop them.

The ordinary felt pad will be found too thick to place over the plate in the printing frames, and should be replaced by one or two pieces of blotting-paper, cut the width of the frame inside, but long enough to protrude an inch at either end. There is no danger of fogging the plates by this method of exposure, when a paraffin lamp, and frames not larger than quarter plate size, are used, as the writer can testify, after exposing several thousand bromide plates in the manner described. If larger printing frames are employed, it is best to use a mask of black paper between the negative and the plate; but with small frames quarter-plate, or 3¼ in. square, the use of a mask is not advised, as it tends, by separating the negative and sensitive plate, to create unsharpness of the image; and in binding the slide, it is always difficult and sometimes impossible, to adjust the mask then used in the exact position of the one used in printing.

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ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.*

Assistant Lecturer on Chemistry and Lecturer on Photography in the Yorkshire College, Leeds.

It has already been explained that care is necessary when interpreting for practical purposes the results obtained with the spectrum. The fact that the curve which represents the action of the spectrum on plates dyed with ammoniacal erythrosin approximates more closely than in the case of any other dye to the curve which represents the action of the spectrum on the eye, indicates very clearly, however, that erythrosin, which was first strongly recommended by Mallmann and Scolik, will be the best sensitiser for general purposes. A number of experiments were therefore made with a view to ascertain how far this conclusion was borne out by experience. The objects photographed include scales of coloured paper, pottery, paintings, flowers, and landscapes, selected with a view to include not only blue and yellow, but a representative range of colour. It has become a somewhat common practice, when orthochromatic processes are discussed, to confine attention almost exclusively to these two colours; but it must be borne in mind that when we are concerned with the gradations or "values" of a picture we have to take into consideration the entire colour scale, and not blue and yellow only. At present the writer has no experience in the application of orthochromatic plates in portraiture, but arrangements are being made for a series of experiments in this direction.

The plates used in the experiments described were Paget Prize Plates XXX, but equally good results were obtained on Wratten and Wainwright's plates of ordinary rapidity. There is no reason to suppose that any essential differences will be observed between the results with different brands of plates, provided that the proportion of silver iodide is not excessive, and doubtless any good commercial plates of medium rapidity will answer equally well. In experiments *A*, *B*, and *D*, the plates were prepared according to Mallmau and Scolik's formula, but in all other cases the same formula was used as in the spectrum experiments. The yellow screen was a collodion film stained with aurantia. Exposed plates were developed with pyrogallol, made alkaline with ammonia, and restrained with ammonium bromide.

In all the cases the experiments were strictly comparative. Ordinary plates were exposed without any screen, and dyed plates were exposed with a yellow screen, under exactly the same conditions of lighting, and *the time of exposure was the same in each case.* It is obvious, therefore, that any differences observed are not due to differences in the exposure. In some cases a dyed plate was exposed for the same length of time without any screen. Care was taken not to under-expose, and it is evident that since the exposures were amply sufficient for the dyed plates behind the yellow screen, the ordinary plates without any screen must have been greatly over-exposed. Every chance was therefore given for yellow, orange, and green to register themselves on the plates, and, moreover, development was conducted with a view to get the best possible result out of the undyed plates.

Undyed plates exposed behind a yellow screen for the same length of time gave no trace whatever of a developable image. The sensitiveness of the plates to green, yellow, and orange is so small, that when the blue and violet are cut off by a yellow screen, the exposure must be prolonged 400 to 500 times in order to obtain an image. Even with sufficient exposure, the results cannot be strictly orthochromatic, since an ordinary plate is always more sensitive to green than to yellow, and more sensitive to yellow than to orange, whereas it ought to have a maximum sensitiveness to yellow, and to be about as sensitive to green as to orange.

A.—A series of seven bands of coloured paper with a matt surface; red, orange, yellow, green, dark blue, purple, and violet.

(1) *Undyed plate—no screen.*—Blue, purple, and violet, practically indistinguishable, and equal to white; green, considerably darker; yellow, darker still, and orange darkest of all; red, comparatively light, owing to the fact that, like most red pigments, it was not pure, but contained a certain proportion of admixed blue.

(2) *Dyed plate—no screen.*—Violet, purple, blue, green, and yellow, all practically equal to white, and indistinguishable; orange, much lighter than in the first case; red, somewhat darker.

(3) *Dyed plate—yellow screen.*—Yellow, brightest of all; green and orange, darker and about equal; violet, purple, blue, and red, all very dark; gradations very fairly correct throughout.

The cut on page 212 is not a very accurate representation of the results. In column (1), violet and blue should be nearly equal to the purple, which was a somewhat bright shade. In column (2), the first five colours should be practically all white. Column (3) is much more accurate.

B.—Bright yellow and brown plate with figures; dark blue and white Japanese vase, sage-green background (see page 453).

(1) *Undyed plate—no screen.*—Yellow plate almost black, great care being required to obtain even the more prominent details; blue of the vase almost equal to the white, the designs being practically unrecognisable; background too dark.

(2) *Dyed plate—yellow screen.*—Plate very much lighter, the details being very well rendered; blue of the vase

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* Continued from page 550.

almost black, the white figures being very distinct; background lighter.

C.—Dark blue and bluish-grey old German pottery; bright yellow plate.

(1) *Undyed plate—no screen.*—Plate very dark, with the principal details of the design barely visible; vases much lighter, with the difference between the grey and dark blue not sufficiently marked.

(2) *Dyed plate—no screen.*—Vases practically the same as in No. 1, but the plate considerably lighter, and the details more prominent.

(3) *Dyed plate—yellow screen.*—Plate bright, with the design well rendered; blue, much darker; grey, about equal to the yellow of the plate.

D.—White narcissi, daffodils, and jonquils, in blue and white vases.

(1) *Undyed plate—no screen.*—Jonquils very dark, and daffodils almost as dark, though with a considerable amount of detail in both cases; narcissi white; blue of the vases much too light, and the design scarcely recognisable.

(2) *Dyed plate—yellow screen.*—Narcissi white; daffodils almost as bright and full of gradation and detail; jonquils slightly darker, with their orange centres still darker; blue of the vases nearly black, and the design well rendered; whole result very satisfactory.

E.—Primroses and violets in dark blue and white vase.

(1) *Undyed Plate—no screen.*—Primroses well rendered, a result due to the long exposure and their pale tint, but their orange centres almost black; violets very much too light; design of the vase lost, the dark blue being almost as bright as the white.

(2) *Dyed plate—no screen.*—Practically the same result as in 1, except that the orange centres of the primroses are much lighter.

(3) *Dyed plate—yellow screen.*—Primroses practically white, but full of detail, and their orange centres slightly darker; violets very dark; blue of the vase also dark, and the design well rendered.

F.—Hyacinths (practically white) and single daffodils (orange) in blue and brown vase.

(1) *Undyed plate—no screen.*—Hyacinths white; daffodils full of detail, but very dark; vase too light.

(2) *Dyed plate—no screen.*—Hyacinths and vases as in 1, but daffodils very much lighter.

(3) *Dyed plate—yellow screen.*—Result very satisfactory; hyacinths white; daffodils nearly white, with beautiful detail; vase darker than in 1 or 2.

G.—Dark blue and purple pansies with yellow centres, and yellow pansies with dark blue centres.

(1) *Undyed plate—no screen.*—Blue and purple very light, but the yellow almost black, the relative gradations being completely reversed.

(2) *Dyed plate—no screen.*—Details and gradations fairly well rendered, but the yellow and blue practically equal in brightness, and therefore indistinguishable.

(3) *Dyed plate—yellow screen.*—Yellow practically white, blue and purple dark, the details and variations in shade being well rendered.

H.—Painting: Sunset (white, yellow, and orange) behind a church (dark olive grey); sunset reflected in water, shadows of which are blue like the outer parts of the sky; brown tree trunk with foliage.

(1) *Undyed plate—no screen.*—Yellow and orange much too dark; church too light; blue of water and sky too light.

(2) *Dyed plate—no screen.*—As No. 1, but the yellow and orange lighter.

(3) *Dyed plate—yellow screen.*—Sunset and its reflection bright, the orange being somewhat darker than the yellow; church dark; blue of sky and water darker than in 1 and 2; gradations generally very good.

J.—Painting: Landscape—Church and trees in distance; trees, shrubs, and road in middle distance; in foreground cottage with red roof, under tree with brownish green foliage; white horse and brown horse; rustic with blue sleeves and brown vest; girl in blue dress with yellow tippet; road yellow and brownish yellow; sky blue and grey.

(1) *Undyed plate—no screen.*—Sky too light; foliage badly rendered; road too dark; brown horse too dark; roof of cottage almost black; yellow tippet almost black; man's sleeves and girl's dress much too light.

(2) *Dyed plate—no screen.*—Greens, yellows, and browns more satisfactory, but improvement not very strongly marked.

(3) *Dyed plate—yellow screen.*—Gradations well rendered; sky darker; improvement in foliage very marked, road lighter; horse lighter; yellow tippet much lighter; blue garments darker.

K.—Painting: Portrait—Girl with fresh complexion, golden hair, dark greenish-blue hat with white feather, pink and white dress, brown book in hand, landscape background.

(1) *Undyed plate—no screen.*—Face and hat fairly good, but contrasts too great; hair too dark and wanting in detail; book too dark; background too dark and deficient in detail.

(2) *Dyed plate—no screen*—Distinct, though not very great improvement in relative gradations of greens, browns, and yellows; most marked in case of the hair.

(3) *Dyed plate—yellow screen.*—Very good result; face capitally rendered; hair full of detail and fairly bright; background much improved.

In the experiments relating to landscapes the same view was photographed under exactly the same conditions of lighting, position, &c., on ordinary plates and on dyed plates, a yellow screen being used in the latter case. The exposure of the dyed plate with the screen was sometimes twice, sometimes thrice as long as the exposure of the undyed plate without a screen. It would be useless to attempt a detailed description of all cases, but the following examples will give some idea of the variety of subjects selected.

L.—Foreground—Water, trees in yellow and yellowish green spring foliage; *middle distance*—town with trees, large stone bridge; *distance*—undulating country with belts of trees, some haze.

M.—Foreground—Grass, water, trees with yellow, yellowish green, and dark green foliage; *middle distance*—stone bridge, trees, and water; *distance*—town with many stone houses and red roofs.

N.—Foreground—road, stone wall, figure, water with fine reflection, trees in full foliage; *middle distance and distance*—river, with trees in full foliage.

P.—Foreground and middle distance—river with rocky bed, trees in full foliage; *distance*—hills with trees and ruined castle, slight bluish haze.

The negatives on ordinary plates show the well-known defects. The distance is much too faint, and if any haze is present, the details in the distance and middle distance are more or less completely obliterated; all brown, yellow, and green objects are much too dark; the water is too bright, and the reflections are frequently lost; the rendering of masses of foliage is unsatisfactory, and no distinction is made between yellow, yellowish green, green, and dark green.

With dyed plates and a yellow screen the improvement is much greater than was anticipated. The rendering of masses of foliage is very fine, and the various shades of green are clearly differentiated. In the case of yellow spring foliage the improvement is particularly noticeable. The water is usually somewhat darker, with more gradation, and the reflections are much more faithfully rendered. Yellow and brown rocks, &c., are lighter, and have better detail. Great advantage is gained by the fact that the yellow screen cuts off the greater part of the atmospheric haze, and the improvement in the clearness and detail of the distances is very striking. It is very well shown by cases K and P. Unless the tint of the yellow screen is too deep, the distance is not rendered so distinct that atmospheric effect is lost.

It will be seen from these results that very great advantages are gained by the use of orthochromatic plates for photographing all classes of coloured objects. The plates prepared with erythrosin are deficient in sensitiveness to red, but in landscape work this colour is not often met with. In other cases the erythrosin may be mixed with a certain proportion of cyanin. With the exception of this one colour, the values "of the photographs obtained in this way are very fairly correct, and are at any rate an enormous improvement on the results obtained in the ordinary way. One very striking consequence of the more correct rendering of the "values" is a much greater stereoscopic effect. Stereoscopic effect in an ordinary picture depends, in fact, almost exclusively on correct values.

The use of a yellow screen is essential to the best results. If no screen is employed, blue, bluish grey, &c., exert too great an action on the plate, and the density of the corresponding parts of the negative cannot be kept down without at the same time reducing the value of yellow, green, and similar colours. It is only when the intensity of the blue rays has been cut down that the images of yellow and green objects can be developed to proper density without the images of the blue objects—for example, the distance—becoming too dense.

Orthochromatic methods have for some time been used with great advantage for the reproduction of paintings, and, in fact, have become indispensable in this class of work. The results obtained by Braun and Co., Dixon and Grey, and especially by the Berlin Photographic Company, are striking examples of the value of these processes. Indeed, it is safe to prophesy that orthochromatic methods combined with photogravure or collotype will be the methods of the future for the accurate reproduction of paintings.

In micro-photography the sensitiveness of the plates to yellow, orange, &c., is of the greatest value, especially in photographing objects which have been stained by the different methods in use amongst microscopists.

In astronomical photography, the increased sensitiveness of the plates not only reduces the exposures required, a very important gain, but the sensitiveness to yellow renders it possible to photograph many yellow and red stars which were formerly impracticable. Then, again, the ability to use a yellow screen, and thus cut off the atmospheric haze which so seriously interferes with photographic and other observations, greatly increases the number of nights on which results can be obtained. Moreover, when the yellow screen is used, it is not at all essential that the lenses should be corrected for what are commonly but erroneously called the "chemical" rays.

Photo-chromo-lithography.—Dr. H. W. Vogel has recently* devised an extension and improvement of Ducos du Hauron's process of photo-chromo-lithography, which, if found workable, will furnish an *indirect* process of photography in natural colours. Ducos du Hauron used only eosin as a sensitiser, and photographed the object on different plates through screens of three different colours. He thus obtained three fragmentary images, each of which contained only those parts of the object the colours of which were transmitted by the screen that had been used. These images were transferred to lithographic stones in the usual way, and each image was printed with a pigment corresponding with the colour of the particular screen that had been employed in its production. The superposition of these images, just as in ordinary chromo-lithography, gave a coloured representation of the object. Since, however, only one sensitiser was applied to the plates, and only three screens and three pigments were used, the resulting pictures were crude and unsatisfactory, all the finer shades and variations of colour being wanting. Vogel proposes to make a much larger number of images, and to use sensitisers corresponding with every region of the spectrum—for example, naphthol blue for red; cyanin for orange; eosin for yellow; safranin for green; and fluorescein for bluish green, the ordinary sensitiveness of the plate being sufficient for blue and violet. In taking the negatives the intensity of the blue and violet must be reduced by means of a yellow screen. The fragmentary images thus obtained are transferred to stones, and each is printed in a colour complementary to that part of the spectrum to which the particular plate was sensitive. This complementary colour is found, however, in the dye which is used to sensitise the plate, therefore the separate images are printed with the dyes which have been used to produce them. Most of the sensitisers are, however, fugitive, and hence it is advisable to use as pigments, not the dyes themselves, but other colours which are spectroscopically equivalent, such for example as aniline blue instead of cyanin. It is obvious that the greater the number of spectrum regions represented by separate images in this way, the more accurate will be the reproduction of the different shades and variations of colour, and the more pleasing and successful the resulting picture.

An attempt has now been made to explain the principles upon which orthochromatic processes are based, and the methods by which these principles are put into practice. The measure of success hitherto attained has been indicated, and the author has endeavoured by new experiments to confirm and extend previous observations. Many problems in both the theory and the practice of these processes have still to be solved, and futher investigations are, in fact, now in progress; but it may be safely asserted that the development of these methods, tardily as it has followed Vogel's discovery of the fundamental principle, constitutes an advance in photography, the importance of which it would be difficult to over-estimate—an advance which not only renders it still more valuable as a handmaid to science, but removes the defect which has hitherto detracted so seriously from its value as a method of pictorial art.

An account of the various patents which exist in connection with the subject will fittingly bring these articles to a close.

(*To be continued.*)

Notes.

Cheap as glass plates are, they will probably become cheaper should the various efforts which are being made to manufacture sheet glass by a continuous process be successful. E. Picard, of Brussels, proposes to operate by means of a rolling apparatus combined with a continually fed reservoir or tank, the rolled strip passing into an annealing gallery.

The photographic portraits of Her Majesty recently taken at Osborne by Gustave Mullins have been already referred to, and in writing we expressed regret that we only saw them in an altered state, after the retoucher had worked upon them.

One of the photographs in question in an untouched condition is now before us, and so fine a photograph is it that we are glad to possess it—and this quite apart from the fact that it is a real photographic portrait of the Queen of England. It is, indeed, a photograph and a portrait of which Mr. Mullins may well be proud.

The Queen is shown in her Jubilee dress—that is to say, the clothes she had on at the time of the ceremony in Westminster Abbey—and she is sitting at a table in a thoroughly natural attitude, her expression being unforced and highly characteristic; indeed, so satisfactory is the work that it goes beyond our comprehension to conjecture why it should have been considered advisable to obliterate much of the character of so finely rendered a face by retouching—retouching that makes it appear as if the Queen was suffering from a peculiar and hitherto undescribed form of œdematous disease; but our extreme expression of astonishment must be reserved for the treatment to which the feather worn by the Queen has been subjected. It is certainly a little unsharp in the true photograph, but the retoucher appears to have made no effort to sharpen its outline and details, and instead of this has scratched over it two series of sharp, curved lines, giving it, in the retouched photograph, an appearance as utterly unlike a feather as it is possible to make it.

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* Annalen der Physik, 1885 (N.S.), 27, p. 130.

To sum up, the photograph is excellent—we think the best portrait of the Queen which we have seen—but the retouching is as bad as anything of the kind which we can find in our collection of photographs—a collection which is by no means small.

With regard to registration of copyright, a question suggests itself. When a production which is partly a photograph of a person, and partly a photograph of a monochrome drawing, is simply registered as a photograph of the person, is such registration invalid on the ground of mis-description?

That specimens sent by assistants are sometimes unreturned as the result of accident or hurry is illustrated by the following, which we have received from a photographer who advertised under the name "Seaside" in the News of the 26th ult:—"As every now and again you receive protests and complaints from assistants on 'Retaining Specimens of Work' by employers who advertise for such, I am afraid I am likely to come under that category, though quite unwillingly on my part. I advertised in the News last issue under *nom de plume* 'Seaside,' and had ten or a dozen replies through your office. However, in replying, I managed to get wrong by sending two prints to one applicant to whom they did not belong. He very kindly and promptly returned these, and to whom they rightly belong I have no idea. Would you assist me by putting a little paragraph stating that 'Seaside' has two specimen prints, which the owner can have by dropping a post-card and describing them. Don't you think that if a prosecution or two were to take place on behalf of an assistant who had been robbed of his specimens, it would do good? I would gladly put five shillings towards the cost." If in any case it could be clearly proved that specimens were obtained for a fraudulent purpose, it should do much good if a prosecution were instituted.

Wolff's self-adhesive mounts come to hand from the agent, Harold Senier, of 88, Norwood Road, S.E. They are coated with a very uniform layer of an adhesive material, and slightly damp photographs adhere well when pressed down on the card. An adhesive mount is very convenient in many cases, but when the paper of the photograph expands unequally by damp—as indeed all machine-made paper does—the whole of the unequal expansion is perpetuated. Indeed, this fact may sometimes be taken advantage of in obtaining a true copy from a distorted print, or a correct print from a paper negative which is unduly stretched in one direction.

The following story which a writer in this month's *Century* relates is not bad:—A New York publisher wanted to take a photograph of the interior of his library by gaslight, and, so that his camera should not be disturbed he determined not to start the exposure until ten o'clock. He reckoned that two hours would be the right time, and, not caring to sit up until midnight, he asked his daughter, who was about to go for a party, what time she would return. "Twelve o'clock," was the answer of the young lady. As the hour was the time he had fixed, he asked his daughter, when she returned, to put the cap on the lens and turn out the gas. This she promised to do, and the good man went to bed in peace. On developing the plate the next day, he was horrified to find it hopelessly over-exposed. "Why, Maggie," he exclaimed, in a voice of unmistakeable parental authority, "what time did you come home last night?" "*Three o'clock,*" faltered the young lady. The horrible tell-tale plates had revealed the truth, and it was useless to prevaricate. The notion is one which ladies whose husbands are addicted to staying late at their clubs might find useful.

Photographic conventions are the order of the day. At the last meeting of the *Société Francaise de Photographie* it was proposed that on the occasion of the Exhibition of 1889 the Society should organise a Photographic Congress. M. Davanne thought the project was impracticable, because a similar idea had been proposed by the Belgians. M. Stebbing, who brought forward the proposition, pointed out, however, that the Belgian Convention was to have been held in connection with the Exhibition at Antwerp in 1885; but nothing came of the idea, and he thought the Society was within its rights in reviving the notion. Ultimately M. Stebbing's proposition was referred to the Committee of Administration.

If the stereoscope comes once more into popular favour, it may be supposed that its re-introduction will not be attended by such a vigorous denunciation of ordinary photographs such as Sir David Brewster employed in advocating the claims of his invention. In the course of a controversy with a well-known photographer of that day he remarked that "the general use of the stereoscope would diminish the number of those grim anamorphoses of humanity which proceed from no studio more copiously than that of Mr. ———, and which, though a terror to the domestic circle, have the merit of showing us how we shall look in the winding sheet or in the more ghastly face of the post-mortem examination." Sir David must have been sorely vexed in spirit when he indited this pointed attack. We are more polite and less personal now-a-days.

The death of Dr. Ingleby, one of the life trustees of Shakespeare's house, recalls the controversy he had with the Town Council of Stratford-on-Avon in respect to the photographing of certain Shakespearian documents. Dr. Ingleby was very anxious to have these documents autotyped, and while the Town Council gave their consent they coupled with it the stipulation that the documents must be photographed in the house (Shakespeare's house) in which they were stored, and that the negatives should become the property of the Corporation. Dr. Ingleby would not consent to these conditions, and so the matter fell through. Mr. Halliwell Phillips, the well-known Shakesperian historiographer, then made a similar application to the Corporation, but with no better success, as he was told he could only be allowed to photograph on the premises, and could not be permitted to be in the house alone. Mr. Halliwell Phillips then declared he would have no more to do with the Shakesperian Autotypes. This was some three years ago, and, so far as we know, nothing has been done. Why do not the Corporation themselves take the matter in hand?

THE SUN'S HEAT.

BY SIR WILLIAM THOMSON, LL.D. F.R.S. M.R.I.*

Professor of Natural Philosophy in the University of Glasgow.

Let precisely what we have been considering be done for every one of our pyramidal rods, with, however, in the first place, thin partitions of matter impervious to heat separating every pit from its four surrounding neighbours. Precisely the same series of events as we have been considering will take place in every one of the pits.

Suppose the whole complex mass to be rotating at the rate of once round in twenty-five days, which is, about as exactly as we know it, the time of the sun's rotation about his axis.

Now at the instant when the paddle stops let all the partitions be annulled, so that there shall be perfect freedom for currents to flow unresisted in any direction, except so far as resisted by the viscosity of the fluid, and leave the piece of matter, which we may now call the Sun, to himself. He will immediately begin showing all the phenomena known in solar physics. Of course the observer might have to wait a few years for sunspots, and a few quarter-centuries to discover periods of sunspots, but they would, I think I may say probably, all be there just as they are, because I think we may feel that it is most probable that all these actions are due to the sun's own substance, and not to external influeuces of any kind. It is, however, quite possible, and indeed many who know most of the subject think it probable, that some of the chief phenomena due to sunspots arise from influxes of meteoric matter circling round the sun.

The energy of chemical combination is as nothing compared with the gravitational energy of shrinkage, to which the sun's activity is almost wholly due. A body falling forty-six kilometres to the sun's surface *or through the sun's atmosphere*, has as much work done on it by gravity, as corresponds to a high estimate of chemical energy in the burning of combustible materials. But chemical combinations and dissociations may, as urged by Lockyer, in his book on the "Chemistry of the Sun," just now published, be thoroughly potent determining influences on some of the features of non-uniformity of the brightness in the grand phenomena of sunspots, hydrogen flames, and corona, which make the province of solar physics. But these are questions belonging to a very splendid branch of solar science to which only allusion can be made at the present time.

What concerns us as to the explanation of sun-light and sun-heat may be summarised in two propositions:—

(1) Gigantic currents throughout the sun's liquid mass are continually maintained by fluid, slightly cooled by radiation falling down from the surface, and hotter fluid rushing up to take its place.

(2) The work done in any time by the mutual gravitation of all the parts of the fluid, as it shrinks in virtue of the lowering of its temperature, is but little less than (so little less than, that we may regard it as practically equal to) the dynamical equivalent of the heat that is radiated from the sun in the same time.

The rate of shrinkage corresponding to the present rate of solar radiation has been proved to us, by the consideration of our dynamical model, to be 35 metres on the radius per year, or one ten-thousandth of its own length on the radius per two thousand years. Hence, if the solar radiation has been about the same as at present for two hundred thousand years, his radius must have been greater by one per cent. two hundred thousand years ago than at present. If we wish to carry our calculations much farther back or forward than two hundred thousand years, we must reckon by differences of the reciprocal of the sun's radius, and not by differences simply of the radius, to take into account the change of density (which, for example, would be three per cent. for one per cent. change of the radius). Thus the rule, easily worked out according to the principles illustrated by our mechanical model, is this:—

Equal differences of the reciprocal of the radia correspond to equal quantities of heat radiated away from millions of years to millions of years.

Take two examples—

(1) If in past time there has been as much as fifteen million times the heat radiated from the sun as is at present radiated out in one year, the solar radius must have been four times as great as at present.

(2) If the sun's effective thermal capacity can be maintained by shrinkage till twenty million times the present year's amount of heat is radiated away, the sun's radius must be half what it is now. But it is to be remarked that the density which this would imply, being 11·2 times the density of water, or just about the density of lead, is probably too great to allow the free shrinkage, as of a cooling gas to be still continued without obstruction through overcrowding of the molecules. It seems, therefore, most probable that we cannot for the future reckon on more of solar radiation than, if so much as, twenty million times the amount at present radiated out in a year. It is also to be remarked that the greatly diminished radiating surface, at a much lower temperature, would give out annually much less heat than the sun in his present conditions gives. The same considerations led Newcomb to the conclusion "that it is hardly likely that the sun can continue to give sufficient heat to support life on the earth (such life as we now are acquainted with, at least) for ten million years from the present time."

In all our calculations hitherto we have for simplicity taken the density as uniform throughout, and equal to the true mean density of the sun, being about 1·4 times the density of water, or about a quarter of the earth's mean density. In reality the density in the upper parts of the sun's mass must be something less than this, and something considerably more than this in the central parts, because of the pressure in the interior increasing to something enormously great at the centre. If we know the distribution of interior density we could easily modify our calculations accordingly; but it does not seem probable that the correction could, with any probable assumption as to the greatness of the density throughout a considerable proportion of the sun's interior, add more than a few million years to the part of solar heat, and what could be added to the past must be taken from the future.

In our calculations we have taken Pouillet's number for the total activity of solar radiation, which practically agrees with Herschel's. Forbes* showed the necessity for correcting the mode of allowing for atmospheric absorption used by his two predecessors in estimating the total amount of solar radiation, and he was thus led to a number 1·6 times theirs. Forty years later Langley,† in an excellently worked out consideration of the whole question of absorption by our atmosphere, of radiant heat of all wave-lengths, accepts and confirms Forbes's reasoning, and by fresh observations in very favourable circumstances on Mount Whitney, 15,000 feet above the sea-level, finds a number a little greater still than Forbes (1·7 instead of Forbes' 1·6 times Pouillet's number). Thus Langley's measurement of solar radiation corresponds to 133,000 horse-power per square metre, instead of the 78,000 horse-power which we have taken, and diminishes each of our times in the ratio of 1 to 1·7. Thus, instead of Helmholtz's twenty million years, which was founded on Pouillet's estimate, we have only twelve millions, and similarly with all our other time reckonings based on Pouillet's results. In the circumstances, and taking fully into account all possibilities of greater density in the sun's interior, and of greater or less activity of radiation in past ages, it would, I think, be exceedingly rash to assume as probable anything more than twenty million years of the sun's light in the past history of the earth, or to reckon on more than five or six million years of sunlight for time to come.

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* Continued from page 558.

* *Edin. New Phil. Journal*, vol. xxxvi. 1844.

† *American Journal of Science*, vol. xxvi. March 1883.

We have seen that the sun draws on no external source for the heat he radiates out from year to year, and that the whole energy of this heat is due to the mutual attraction between his parts acting in conformity with the Newtonian law of gravitation. We have seen how an ideal mechanism, easily imagined and understood, though infinitely far from possibility of realisation, could direct the work done by mutual gravitation between all the parts of the shrinking mass, to actually generate its heat equivalent in an ocean of white-hot liquid covering the sun's surface, and so keep it white hot while constantly radiating out heat at the actual rate of the sun's heat-giving activity. Let us now consider a little more in detail the real forces and movements actually concerned in the process of cooling by radiation from the uttermost region of the sun, the falling inwards of the fluid thus cooled, the consequent mixing up of the whole mass of the sun, the resulting diminished elastic resistance to pressure in equi-dense parts, and the consequent shrinkage of the whole mass under the influence of mutual gravitation. I must first explain that this "elastic resistance to pressure" is due to heat, and is, in fact, what I have, in the present lecture, called "Sir Humphry Davy's repulsive motion." I called it so because Davy first used the expression "repulsive motion" to describe the fine intermolecular motions to which he and other founders of the Kinetic Theory of Heat attributed the elastic resistance to compression presented by gases and fluids.

Imagine, instead of the atoms and molecules of the various substances which constitute the sun's mass, a vast number of elastic globes, like schoolboys' marbles or billiard balls. Consider, first, anywhere on our earth a few million such balls put into a room large enough to hold a thousand times their number, with perfectly hard walls and ceiling, but with a real wooden floor; or, what would be still more convenient for our purpose, a floor of thin elastic sheet steel, supported by joists close enough together to prevent it from drooping inconveniently in any part. Suppose in the beginning the marbles to be lying motionless on the floor. In this condition they represent the atoms of a gas, as for instance, oxygen, nitrogen, or hydrogen, absolutely deprived of heat, and therefore lying frozen, or as molecular dust strewn on the floor of the containing vessel.

If now a lamp be applied below the oxygen, nitrogen, or hydrogen, the substance becoming warmed by heat conducted through the floor will rise from its condition of absolutely cold solid, or of incoherent molecular dust, and will spread as a gas through the whole enclosed space. If more and more heat be applied by the lamp the pressure of the gas outwards in all directions against the inside of the enclosing vessel will become greater and greater.

As a rude mechanical analogue to this warming of a gas by heat conducted through the floor of its containing vessel, from a lamp held below it, return to our room with floor strewn with marbles, and employ workmen to go below the floor and strike its underside in a great many places vehemently with mallets. The marbles in immediate contact with the floor will begin to jump from it and fall sharply back again (like water in a pot on a fire simmering before it boils). If the workmen work energetically enough there will be more and more of commotion in the heap, till every one of the balls gets into a state of irregular vibration, up and down, or obliquely, or horizontally, but in no fixed direction; and by mutual jostling the heap swells up till the ceiling of the room prevents it from swelling any further. Suppose now the floor to become, like the walls and ceiling, absolutely rigid. The workmen may cease their work of hammering, which would now be no more availing to augment the motions of the marbles within, than would be a lamp applied outside to warm the contents of a vessel, if the vessel were made of ideal matter impermeable to heat. The marbles being perfectly elastic will continue for ever* flying about in their room, striking the walls and floor and ceiling and one another, and remaining in a constant average condition of denser crowd just over the floor, and less and less dense up to the ceiling.

In this constant average condition the average velocity of the marbles will be the same all through the crowd, from ceiling to floor, and will be the same in all directions, horizontal, or vertical, or inclined. The continually repeated blows upon any part of the walls or ceiling will in the aggregate be equivalent to a continuous pressure which will be in simple proportion to the average density of the crowd at the place. The diminution of pressure and density from the floor upwards will be precisely the same as that of the density and pressure of our atmosphere calculated on the supposition of equal temperature at all heights, according to the well known formula and tables for finding heights by the barometer.

In reality the temperature of the atmosphere is not uniform from the ground upwards, but diminishes at the rate of about 1° C. for every 162 metres of vertical ascent in free air, undisturbed by mountains, according to observations made in balloons by the late Mr. Welsh, of Kew, through a large range of heights. This diminution of temperature upwards in our terrestrial atmosphere is most important and suggestive in respect to the constitution of the solar atmosphere, and not merely of the atmosphere or outer shell of the sun, but of the whole interior fluid mass with which it is continuous. The two cases have so much in common that there is in each case loss of heat from the outer parts of the atmosphere by radiation into space, and that in consequence circulating currents are produced through the continuous fluid, by which a thorough mixing up and down is constantly performed. In the case of the terrestrial atmosphere the lowest parts receive by contact heat from the solid earth, warmed daily by the sun's radiation. On the average of night and day, as the air does not become warmer on the whole, it must radiate out into space as much heat as all that it gets, both from the earth by contact, and by radiation of heat from the earth, and by intercepted radiation from the sun on its way to the earth. In the case of the sun the heat radiated from the outer parts of the atmosphere is wholly derived from the interior. In both cases the whole fluid mass is kept thoroughly mixed by currents of cooled fluid coming down and warmer fluid rising to take its place, and to be cooled and descend in its turn.

(To be continued.)

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.†

CAPRI.

> "Lo! there rises not far from Naples, the sunny island
> Crowned with Dædalian rocks. There, in the sapphire grottoes,
> Cupid delights to dream; and to dwell in the siren's chambers.
> There the phosphoric wave whispers in luminous ripples,
> There the love-drowsy air quivers in azure twilight."
> —*Gregorovius.*

Down on the quay by the Santa Lucia in Naples all was activity and bustle; porters and boatmen innumerable were busy conveying passengers to the steamer for Capri which lay at anchor in the bay. Naples is behindhand in the matter of piers, and possibly the authorities think that the boatmen's trade would suffer if there were one. In the island of Sark this idea is carried still further, for although there is a good stone pier at the entrance of the harbour, the small screw steamer from Guernsey is not allowed alongside, for the one reason that the islanders would suffer from the loss of plunder in ferry dues. But to return to, or rather, to reach our steamer. Crowds were coming aboard, and we began to fear that we should not find our dream of rest in Capri a true one. The morning was perfection, and, although February, the days were growing warm, and a soft summer haze half obscured the lower slopes of Vesuvius, while delicate wreaths of vapour at the summit betokened that the quiet was merely outside, and that still an unrestful spirit inhabited the interior of the mountain.

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* To justify this statement I must warn the reader that the ideal perfectly elastic balls which we are imagining must be supposed somehow to have such a structure that each takes only a definite average proportion of its share of the kinetic energy of the whole multitude, so that on the average there is a constant proportion of energy in the translatory motions of the balls, the other part being the vibratory or rotational motions of the parts of each ball. For simplicity also we suppose the balls to be perfectly smooth and frictionless, so that we shall not be troubled by need to consider them as having any rotatory motions, such as real balls with real frictional collisions would acquire. The ratio of the two kinds of energy for ordinary gases, according to Clausius, to whom is due this essential contribution to the kinetic theory, is—of the whole energy, three-fifths translational to two-fifths vibrational.

† Continued from page 555.

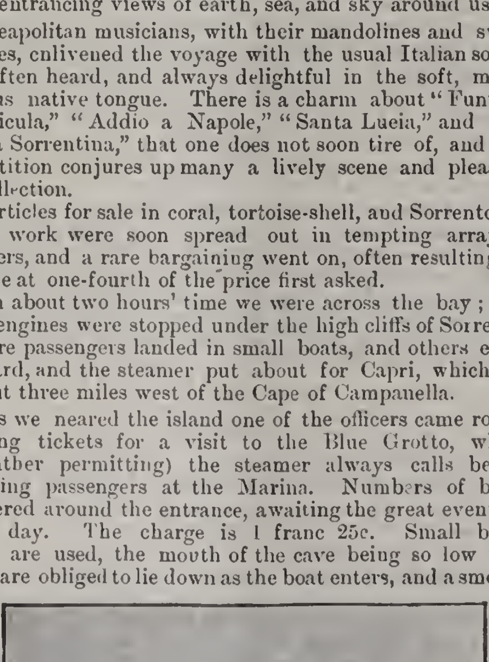
The steamer starts punctually at nine o'clock. Small boys had come aboard with Italian papers, and it was then that we learned the terrible news of the earthquake along the Riviera; on our return visit to Rome we heard more particulars from eye-witnesses, or "quakers," as we have since heard them called. Rome certainly benefited by the earthquake, and was inconveniently full. But to return to the Capri steamer. The boat was much larger than the *Vapore tres Magnifique*, of Ischia. The sun shone full on Naples as we weighed anchor and steamed rapidly across the calm waters of the bay. We passed through a host of tiny fishing craft with their picturesque lateen sails, and we basked lazily on the deck, enjoying the entrancing views of earth, sea, and sky around us.

Neapolitan musicians, with their mandolines and sweet voices, enlivened the voyage with the usual Italian songs, so often heard, and always delightful in the soft, mellifluous native tongue. There is a charm about "Funiculi Funicula," "Addio a Napole," "Santa Lucia," and "La bella Sorrentina," that one does not soon tire of, and the repetition conjures up many a lively scene and pleasant recollection.

Articles for sale in coral, tortoise-shell, and Sorrento inlaid work were soon spread out in tempting array by dealers, and a rare bargaining went on, often resulting in a sale at one-fourth of the price first asked.

In about two hours' time we were across the bay; and the engines were stopped under the high cliffs of Sorrento, where passengers landed in small boats, and others came aboard, and the steamer put about for Capri, which lies about three miles west of the Cape of Campanella.

As we neared the island one of the officers came round selling tickets for a visit to the Blue Grotto, where (weather permitting) the steamer always calls before landing passengers at the Marina. Numbers of boats hovered around the entrance, awaiting the great event of the day. The charge is 1 franc 25c. Small boats only are used, the mouth of the cave being so low that you are obliged to lie down as the boat enters, and a smooth sea is indispensable. The longer you stay in the cavern the bluer and clearer does every object appear. You look down into clear water of a deep turquoise blue, and you see the fish swimming about; the vaulted roof and the surrounding rocks become blue, and the splashes caused by the oars look like sprays of molten silver. The rocks on the outer side of the cavern do not dip far below the surface, hence the light passes in through the water, and illumines the cavern. We soon shot out again under the tiny arch, and pretty Capri girls, who had descended the steep rocks above, congregated on the narrow ledges, and threw flowers into the boats as they passed. The small craft were soon all tied astern of the steamer, and towed to the Marina, where they were used in landing passengers and luggage. Those who had come simply for the day had just time to lunch and take a donkey ride for a short distance up the steep roads: they would see something of the grand precipitous cliffs, and perchance go away thinking that they had done Capri.



We made for our old quarters, the Grotto Blue Hotel, situated just above the Marina; a comfortable and quiet house, save at lunch time, when the visitors are thick on the ground inside and out. During that festive meal coral girls with their fascinating manners and wares walk in and out as if the place were their own; but as soon as the Naples steamer has left, quietness reigns. The hotel charges are moderate; six francs per day pays for everything, including wine. No one can complain of a want of ventilation and air, for where you naturally look for the front door you find merely an archway, in close proximity to which the stone stairs ascend to the bedrooms. The system may be safe in a small island which is accessible at only two places, but it has its disadvantages. When you put your boots outside your room door, you practically place them in the open air, as far as the discriminating public is concerned; and cats, whose tones are about as musical in Capri as they are in England, and who there also choose the early morning hours for their concerts, have free access to all the passages. The consequence of all this trustful simplicity in the matter of open house was, that at an hour when graveyards are supposed to yawn, and when all decent folks are abed, we were awakened by a catawalling among the boots outside our room, so horrible and discordant that we devoutly wished that the hotel possessed a front door, and that the unfeline brutes were on the outside of it. But you forget all about the horrors of the night as you step into the balcony in the cool early dawn, and behold the sun rise over Vesuvius, throwing the grand eastern precipices of Capri into dark shadow, while its beams shine over the sea and light up the heights of Monte Solaro and the eastern end of the island.

The days in Capri glide rapidly by; there are numberless delightful walks and climbs, and plenty of "subjects" among the people and their surroundings. The Greeks settled in Capri about 500 B.C., and the inhabitants still retain distinct traces of the Greek type of countenance. The Emperor Augustus purchased the island from the Greeks of Neapolis, and he occasionally retired there when weary of life in the bustling capital, and enjoyed the simple ways of a country gentleman. Afterwards, the Emperor Tiberius retired there, and lived in seclusion for seven years, leading a life of sensuality and cruelty. There are the remains of twelve palaces which were built for him, many of them having been demolished soon after his death. Capri was taken by the English in 1803, and narrowly escaped being converted into a miniature Gibraltar. The French captured it five years afterwards, and held it for a short time. It measures about eleven miles round. It is a good morning's excursion to the top of Lo Capo, at the east end of the island, where ruins of the Villa Jovis, one of the principal palaces of Tiberius, crown the summit; but early morning being the right time to photograph the Marina, we spent half an hour there among the boats and fisher folk first, finding many good bits. We then climbed the steep narrow lanes to the town of Capri, built on the saddle connecting Lo Capo with Monte Solaro. Capri stands 460 feet above the sea, and has about 2,500 inhabi-

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tants ; the numerous high walls hide many a good view, but the small piazza, arches, covered streets, and narrow slums are all good, and there are one or two fine palm trees. Hotels are plentiful, and prices are cheap. Passing through the town we came upon ancient Roman masonry, and other ruins, beautified by aloes and kindred plants, favourite subjects with the many artists who live in or visit the island. We saw a few at work, chiefly Germans.

A path through farms leads up the mountain to a small locanda adjoining the Villa Jovis. Here wine and biscuits are temptingly laid out, and while refreshing the inner man you can sit on the small terrace overlooking the awful precipice from which tradition says Tiberius had his victims flung into the sea 700 feet below. No willing victim being at hand, we dropped a large stone over, and timed its descent—eight seconds. The view from this spot is as lovely as it is extensive. The eye roams over the promontory of Sorrento, with the mountainous country extending over its southern slopes to Amalfi, the coast line on that side being broken by the rocky islands of the Sirens. Vesuvius and the Bay of Naples help to make up a grand panorama. A hermit keeps a small chapel here, and a visitor's book, and is glad of contributions.

A narrow, stony path on the south side of the hills leads to the natural arch on the rocky coast, and from there you can descend a steep bank to the sea, where are the monster island rocks of the Faraglioni. Sketching and photography were attempted, but the subject is rather vast and near. Returning to our hotel by the Marina, we passed along a shady path under olive trees, overlooking the town of Capri. The day was extremely still and sunny, and good views were taken. Further down, on the new carriage road, we caught another pretty effect: an olive orchard stood between us and the sea, and looking through the trees, framed, as it were, by olive branches, we could see the Naples steamer at anchor.

As we entered the hotel, ready for lunch, with its usual accompaniments of coral girls and daily visitors, we found a beautiful subject in a group of donkeys, women, and children in front of the garden gate. The sea was dotted with steamers and small craft at anchor, the Marina lay under the shadow of the great precipices of Lo Capo ; the distant coast of Italy, the splendid sunshine, and the natural harmonious composition, all combined to make one of the best instantaneous pictures of our series.

We spent the afternoon at the Picola Marina on the south side of the island. Moorland lanes and steps lead down to it from the town of Capri. It is but little frequented; a few boys basking in the sun, and fishermen mending their nets constituted the life of the place. We took a few photos of the rock strewn beach, with the Faraglioni in the distance ; and a dip in the sea at that quiet spot after the heat and work was most refreshing.

The days were short, and the nights very dark and somewhat cold, and we were glad of the wood fire in the alon after dinner as we sat sipping coffee, over books and diaries. The salon had three doors ; one opened into the salle-a-manger ; another on to the hall, which had the archway lacking the front door ; and the third on to the terrace high above the sea ; and ever and anon we stepped out into the quiet darkness to listen to the lapping of the water on the shore, and to watch the red glow over the mountain across the bay, as it flared up like "a pillar of fire by night," the black frowning island precipices being just discernible.

There are two roads to the town of Ana Capri situated at the west end of the island, on the high table land beyond Monte Solaro. A broad new carriage road leads up by many circuitous turns, but the pleasanter way for pedestrians is by the steep rocky pathway, and the steps numbering nearly 600. Soon after leaving our hotel, passing through cultivated fields and olive groves, we came upon the steps, the morning sun full upon them, as they wind up the mountain amongst luxuriant growth of plants and bushes. Pictures are nearly as numerous as the steps themselves: the girls as they pass up and down, or rest awhile from their burdens ; the luxuriant flora, not a leaf moving in the still morning air ; the view around, increasing in beauty and extent the higher you go. Now a lovely peep between the bushes, just framing a little of the Marina, the sea and the eastern rocks ; further up the east end of the island is spread out before you, and from the bay, with its steamers on the north side, the eye wanders up to the town of Capri, and on to the Villa Jovis, surmounting its terrible precipices.

A number of barefooted maidens, returning empty-handed to Ana Capri, passed us on the steps, and to our surprise, instead of taking the turn of the pathway to the left, they made straight for a gigantic wall of rock in front, climbing its nearly perpendicular surface hand and foot, coming out on the pathway high above, and gaining a good quarter of an hour by the manœuvre. We looked at the rock, essaying to follow, but shuddered as we gazed down its steep side to the sea, and thought how we might never reach the top. We were beaten by a troop of country girls.

About a thousand feet above the sea two stone arches cross the path. In olden times they might have easily rendered Anacapri impregnable, for steep precipices bound the narrow roadway above and below, and Monte Solaro effectually bars all other ingress. The town, as seen from a steamer out at sea, looks like a great white streak on the face of the rock ; but in reality there is a wide table-land. Monte Solaro can only be ascended from that side ; there is a good mule path up, and the view from the summit, 1,980 feet above the sea, well repays the climb. Instead of following the path, I struck straight up to the old castle of Barbarossa (called after the pirate who demolished it). I found it to be on the edge of a precipice, and lay down to look over. The steep rocky sides of the gorge descended to the green oasis below, where the island lay like a sunny picture framed by the limestone crags. The wind blew hard, and I was glad to beat a retreat without taking a photo. It was warm work toiling upward and along the mountain ridges, up and down valleys, with camera and plates instead of a walking-stick, but from the old ruined fort on the summit the views surpassed those seen from many a nobler height. The whole island can be seen from this point. The south side rises abruptly from the sea, and the low walls of the fort protect you from the most frightful precipices. To the east the lonely hermitage stands, 200 feet below, on the verge of another precipice, and looking through a doorway on the west side of the building you see Ana Capri lying far down on the table-land, looking like a collection of white tents. Far away over the rocks of the Faraglioni the dim outline of the Bay of Salerno, as far as the ruins of Paestium, is discernible, the rugged coast lines leading to Amalfi and Sorrento, and the great sweep of the Bay of Naples, carry the eye onward to the islands of Proceda and Ischia, and to the wide blue sea bounded only by the horizon. The glorious view from that mountain peak, and the utter stillness as I lay on the turf under the bluest of canopies, were intoxicating; but my reverie was soon interrupted, and I was brought back to earth by the voice of a German tourist who wanted to know, "Ze price of ze instrumong" that I was using. He and his wife had come up on donkeys, and I was no longer alone. The descent to Ana Capri by the mule track was quick enough, and the last gleams of the setting sun as it gilded the roofs of Capri gave me one more good photo from the steps as I neared our hotel.

One "Raffielle of Sorrento" had spoken to us of his boat, and of his willingness to convey us to Amalfi the next day; but the sultry stillness was succeeded by a threatening sunrise and dark heavy clouds, and as the time for our departure drew near, and no Raffielle appeared, we descended to the Marina to hunt him up. There we were told that Raffielle, not liking the look of the morning for so long a voyage as that to Amalfi, had quietly gone off in the early hours, and was then probably snug in Sorreuto. There was nothing for it but to make a fresh bargain, and between our landlord and a son of Neptune who was bent upon making capital out of what he considered to be a coming storm, we had to pay five francs more than the sum asked by Raffielle. By ten o'clock his boat was ready, manned by a crew of four; we had said good-bye to Capri's beautiful scenery and its lovely girls, two of whom (professional coral sellers) were even then down on the little pier, temptingly spreading out their wares before our enraptured gaze. Who could blame us if vows of economy were broken, and more coral was bought?

The young men of Capri go out on long voyages coral fishing, and on their return, after many months' absence, there is a sort of harvest thanksgiving. The girls, meanwhile, are left at home to do the work; they carry tourists' luggage up and down to the hotels and steamers, great kegs of wine or water, and many other burdens grievous to be borne. They also mend the roads and help to build houses and walls. They are mostly well-featured, and some of them sit as models to the numerous artists who visit or live on the island. Capri has a delightful climate, the heat of summer being tempered by the sea breezes.

We stepped aboard our boat, and were soon in the shadow of the steep eastern precipices. Here the men ceased rowing, and while they were hoisting the sail I looked up at the giant crags and down into the deep clear water, and a thrill passed through me as I remembered a deed of darkness which is said to have occurred many centuries ago about this very spot. The description of this incident is to be found in a book by J. W. Graham, lately published by Macmillan and Co., entitled "Neara: A Tale of Ancient Rome." Every lover of Capri and its history should read this book; it is a story of great dramatic power, of extreme beauty and interest, and it pourtrays the island and its life at the time of the Emperor Tiberius in a graphic and realistic way that is most refreshing. "The sails were filled, and fair the light winds blew;" and as we looked back at the fast-receding island, one of the sailors seemed to divine our thoughts, for he also looked back, saying, as he did so, "Addio Capri!"

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Patent Intelligence.

Application for Letters Patent.

11,782. John Thomas Mayfield and Joseph Torr Todman, 21, Finsbury Pavement, for "An improved sliding shutter, applicable to photographic and other purposes."—Dated 30th August, 1887.

Official Abstract of Accepted Complete Specification.

13,240 of 1886. Thornton. "Cameras (including lens and lens fittings)."—Tripod attachment: front in halves to admit revolving lens panel; disconnecting devices for front fork; angle guide rails; plumbing indicator.

14,099 of 1886. Kellar. "Developing, fixing, washing, and retouching." Washing apparatus: perforated cylinder turned in tank by water wheel.

14,120 of 1886. Parkes. "Printing, Colouring, and Finishing." Colouring: print placed on temporary support of opal glass, &c., for development and colouring.

14,262 of 1886. Park. "Telescopic baseboard:" brackets carrying back connected to slides on side of baseboard.

5772 of 1887. Wolff. "Miscellaneous." Mounting cards prepared with adhesive coating.

Specification Published.

12,571. William James Lancaster, of Colmore Row, Birmingham, in the county of Warwick, Manufacturing Optician, for "A new or improved pocket or portable apparatus for the taking of photographic pictures."—Dated 4th October, 1886.

The Patentee says:—My invention has for its object the production of an extremely portable apparatus, for the taking of photographic pictures, and which said apparatus may be made either in the form of a watch or chronometer case, tobacco box, match box, cigar or cigarette case, purse, locket, charm, or other like article, by which means a person is able to carry a complete photographic apparatus in a very small compass.

I will describe my invention in connection with a watch or chronometer case to be carried in the pocket or about the person. I take an ordinary watch case, having a hinged closing front or lid, which is automatically opened by pressure applied at the side or at the loop part, which liberates a catch bolt, and so allows the enclosing lid to fly open. Within the hollow of the body of the case the camera is situated, which consists of a number of short tubes working telescopically one within each other, so as to render the same collapsible when not in use. The back tube of these series of tubes, which is of larger diameter, is secured loosely within the inner edges of the open front of the case, by a flange connection, and within the inside of this telescopic body a coiled spring is enclosed, which automatically distends or opens out the camera body on the lid of the case being opened. The lens is secured within the last or outward tube, while the dark slide, which contains sensitised paper, gelatine sheets, or prepared plates, is disposed at the back. The focussing of the lens may be done by any suitable adjustable expedients, or by hand. The dark slide consists essentially of a flat case with folding overlapping doors, having spring hinges which automatically open the said door on a catch or other fastener being liberated. The catch fastener consists simply of a button or turn, which on being rotated is made to engage with or be disengaged from one of the doors. The back of the enclosing case is pierced with a hole suitable for the reception of the frame of what is commonly known as the dark slide, and which is held in position by rotating turns, or catches, moved in and out of position, preferably by hand.

In using the instrument or apparatus in order to take a portrait, simply press the releasing catch of the enclosing lid, when it automatically flies open, and allows the body of the camera (and lens within its front) to be distended to its fullest extent by the expansion of the enclosed coiled spring. After focussing, a button or turn at the back of the case is rotated, when the doors of the dark slide automatically fly open, and so present the sensitised surface or plates enclosed within.

After sufficient exposure has been allowed, the lid of the enclosing case is simply closed, when the collapsing body of the camera and the lens at its end is folded up and enclosed within the body of the case, when the negative can afterwards be removed from the dark slide, and placed in a printing frame as usual. The apparatus or appliance is principally applicable for taking instantaneous photographs for detector purposes. The bellows constituting the body of the camera may be formed gusseted, when made of leather or india-rubber; the said body may be made of a coiled ribband spring, with the coils or involutes working telescopically one within each other. Instantaneous shutters may be provided at the lens end of the photographic apparatus, instead of at the dark slide end; in the former case, the shutters or doors are likewise made to instantaneously open by an automatic or other device, which may be regulated to any pre-determined exposure as may be necessary. The application of my invention to other articles, such as purses, cigar and cigarette cases, lockets and other pendant articles, differs in no essential respect from its application to a watch case as already described.

I will now proceed to describe with reference to the accompanying drawings the manner in which the same is to be performed. Figure 1 is an elevation, and figure 2 is a transverse horizontal section on the dotted lines A B figure 1, of a portable photographic apparatus in the form of a watch or chronometer constructed according to my invention. Figure 3 represents partly in elevation, and partly in horizontal section, the said photographic apparatus, with the enclosing case or cover open, and the collapsible telescopic body of the camera, ready for the taking of a photographic picture, on the shutters, which are now closed, being opened. Figure 4 represents the same view as figure 3, but with the shutters open, exposing the sensitized plate or film enclosed within the shutter box or dark slide. Figure 5 represents a full vertical section of the said apparatus, but taken at right angles to the other sections, figures 2, 3, and 4. Figure 6 represents a back view of the said apparatus, with the back hinged cover or cap open, showing the back of the shutter box or dark slide fixed in position. Figure 7 shows a like view as figure 6, but with the shutter box or dark slide removed, and exhibiting through the gap or opening, wherein the front of the said box or slide fits, the concentric telescopic tubes, which form the collapsible body part, and at the front or extreme end of which the lens is situated. Figure 8 is a front view of the shutter box or dark slide. Figure 9 represents a top side view of the said figure 8, while figure 10 represents the same view as figure 9, but with the shutters open. The same letters of reference indicate corresponding parts in the several figures of the drawings. a is the body of the enclosing case of the apparatus, and b is the front hinged lid or cap, and c is the back, which on both being closed, encloses the whole of the photographic apparatus within the case, as in figure 2. The front cap b is provided with a spring hinge, and is secured by a bolt b^2, directed vertically through the bow of the loop; and which said bolt and spring is like that of an ordinary watch or chronometer, and on the former being compressed the cap is automatically opened, and the camera telescopic body d, shot out from its collapsed condition, by a coiled spring e enclosed within the interior of the said body. The body consists preferably of a series of telescopic tubes, working one within the other, and with flanged ends, so as to keep the system of connected tubes together. Instead of short lengths of tubes or rings of dissimilar diameter being employed, a flexible bellows body may be used. Or the bellows body may be substituted by a ribband spring which opens out spirally or helically. In this case no interior auxiliary spring is required.

FIG 1

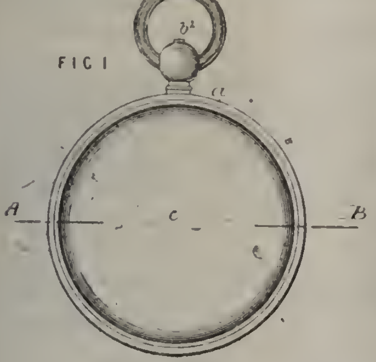


FIG 2

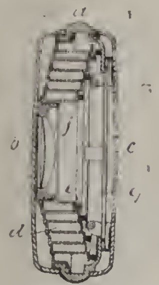


FIG 5

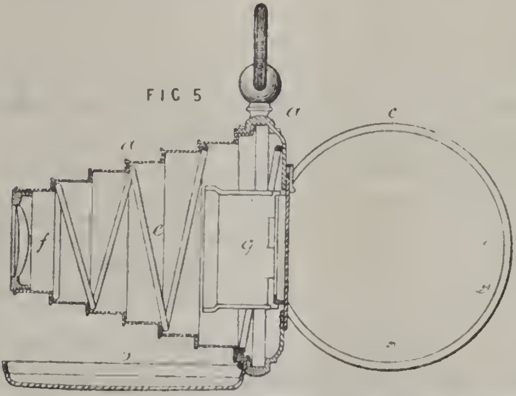


FIG 3

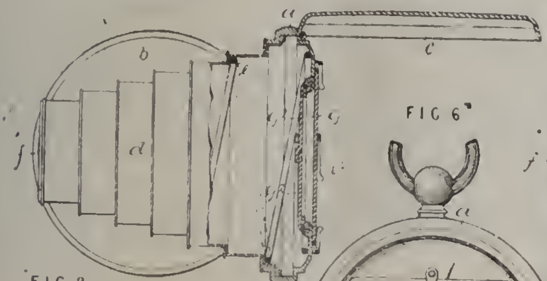


FIG 4

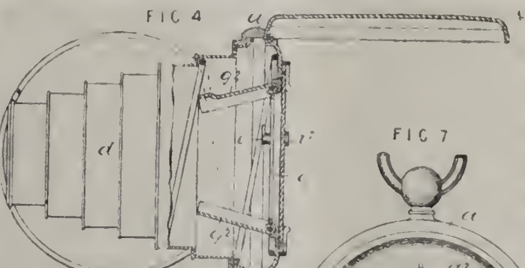


FIG 6

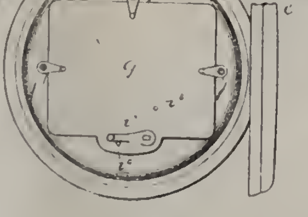


FIG 7

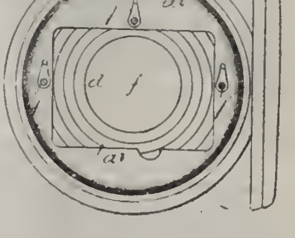


FIG 8

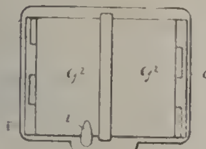


FIG 9

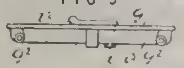
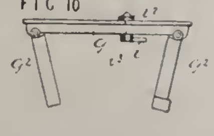


FIG 10



The camera has an ordinary photographic lens f at its front, and a shutter box or dark slide g at its back, wherein sensitised paper, gelatine sheets, or prepared plates are placed. This shutter box or dark slide has folding over-lapping shutters g^2, g^2, with spring hinges at their joint ends, so that when the shutters are released by a catch i, worked by a catch lever i^2, connected by an axis i^3, they automatically spring open into the positions best shown in figures 4 and 10, and expose the sensitised film, plate, or the like situated at the back of the dark slide or shutter box. The motion of the catch lever or arm is limited by the stops i^4, as best seen in figure 6. The body of the enclosing case a has a diaphragm a^2 at its back, and is pierced about its middle with a hole a^3, wherein the box part of the dark slide fits, with the back flanged part resting on the back of the diaphragm. This dark slide is secured in position by jointed turns j.

In using the apparatus for the taking of a photographic picture, press the releasing catch b^2, when the hinged front cap b will fly open, and allow the body d to automatically distend itself into the position as represented in figures 3, 4, and 5. The back hinged cap c is next opened, and the camera adjusted, or the image focussed; this done, the arm i^2 of the catch i is now turned, from left to right, so as to bring the said catch from in front of the shutters, when the said shutters automatically fly open, as in figure 4, and a photographic picture of an object is taken.

When not in use, the apparatus is collapsed, as in figure 2, with the necessary sensitised paper, gelatine sheets, or prepared plates within the dark slide or shutter box.

Figure 11 shows in perspective a cigar or cigarette case, having within its interior photographic apparatus constructed and arranged, according to my invention. Figure 12 represents the said cigar or cigarette case opened, and the photographic apparatus ready for use. [Figs. 11 and 12 have not been reproduced.—Ed. P.N.]

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that which I claim is—First—The means herein described of taking photographic pictures, by combining with a watch or chronometer case, cigar or cigarette case, tobacco box, match box, purse, locket, charm or other similar pocket or pendant article, of a photographic apparatus. Secondly—The combination with a watch or chronometer case, cigar or cigarette case, tobacco box, match box, purse, locket, charm, or other similar pocket or pendant article, of a photographic apparatus constructed, arranged, and worked substantially as described and set forth. Thirdly—Making the camera bodies of portable photographic apparatuses of the kind herein described distend themselves automatically, on the front cap being opened, as described and illustrated. Fourthly—Providing "dark slides" or boxes for holding photographic sensitised plates, films, or paper, with spring hinged folding doors or shutters, and which said boxes are constructed, and the doors or shutters held (closed) and liberated by means herein described and illustrated.

Correspondence.

THE NOMENCLATURE OF LENSES.

Sir,—Will you allow me to add a few remarks on the above subject, and the discussion that arose from the protest of Messrs. Voigtlander and Son. I feel confident that everyone who has fairly considered the question will acknowledge the spirit of the protest is just; and that the designation of particular manufactures should be respected as proprietary.

Messrs. Perken, Son, and Rayment are only one of many dealers, and some (perhaps) manufacturers, who have lately systematically advertised lenses styled similarly to inventions to which particular designations were given by the originator. I refer to the terms "Rapid Rectilinear" and "Wide Angle Rectilinear." You, sir, and many of your readers are well aware of the fact that not long ago the above terms as applied to photographic lenses were often used alone, and were as distinctive of manufacture by Dallmeyer as were the "Rapid Symmetrical" and "Portable Symmetrical lenses of Ross, the "Aplanats" of Steinheil, and the "Euryscopes" of Voigtlander.

While fully appreciating the truth of the maxim of "imitation" in its relation to genuine and sincere flattery, I cannot but commiserate those whose vocabulary does not permit of an independent selection of titles suited to their own articles.

I understand that Messrs. Marion and Co. have engraved lenses "Rapid Rectilinear," but it is due to them to say that they have discontinued doing so, acknowledging the title as proprietary.—Yours truly,

19, Bloomsbury Street, W.C. Thos. R. Dallmeyer.

Talk in the Studio.

London and Provincial Photographic Association.—A meeting was held on Thursday, the 1st inst., at Mason's Hall Tavern, J. T. Taylor in the chair, and the proceedings consisted mainly in the discussion of the proposed rules and the nomination of a Committee.

Taking Negatives in Absolute Darkness.—J. W. Ralstone writes:—"I see in a note in your last issue that you scoff at the statement of a weekly paper that it is now possible to take negatives in absolute darkness. I had a dozen fine negatives which I left in my studio in printing frames on Tuesday night; on Wednesday morning they were gone; they had been taken in absolute darkness. I think the apparatus used was a skeleton key. Hoping this fresh departure in the art of negative taking may interest you."

Fine Art Exhibition at King's Lynn.—T. Smith and Sons, of King's Lynn, have, with the assistance of local notables, organised a fine art exhibition, which is to be opened on November 9th, and is to last a fortnight. There are forty-four classes, photography coming under the headings 12, 13, 14, and 15. Those wishing for further particulars should write to T. Smith and Sons, 60, High Street, King's Lynn.

Manchester Amateur Photographic Society.—This Association announces the intended issue of a Quarterly Magazine, the organ of Society. Members who have any communications, queries, letters to the editor, entries for the sale and exchange column, &c., for insertion in the first number of the magazine, must forward them to the Editor, Wm. Stanley, 21, Howard Street, Eccles New Road, Salford, on or before Saturday, September 24th, 1887.

Photographic Club.—The subject for discussion on September 14 will be on "Simple Cameras." Saturday outing at Rickmansworth; train from Moorgate Street at 2·10.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

F. M. Fox.—1. If it is thoroughly saturated with melted paraffin wax, the acid will have little or no action. 2. We cannot even guess without seeing the print. 3. It should have been treated with the solution before fixing. 4. Doubtless it is a misprint for nitrate. 5. Next week, or, at latest, the week after.

W. B.—It shall be attended to on its arrival.

Victor.—1. Focus with the full aperture, and then use a stop about one inch in diameter. 2. If the bath is strongly acid, you will always obtain the tone referred to.

Operator.—There is no other book of the kind.

Chas. Pocock.—The amended formula is duly to hand, and we are much obliged to you.

Alpha.—You probably dry the films at too high a temperature, and very likely make them thicker than is necessary.

A. C. Wilmet.—1. Heat is, we should think, an essential in this case; otherwise the pressure will fall too rapidly. Perhaps a steam coil round the container will answer. 2. As regards this maker, we cannot give you information now, but may be able to obtain the particulars you want. In this case we will write to you.

J. C. Stephens.—1. The glass in question is not at present available for the construction of photographic lenses, as it not only possesses a slight yellow tint, but becomes more yellow by exposure to light. 2. Certainly; we shall have much pleasure in doing as you suggest. 3. The name is, we believe, E. L. Warde.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. [illegible].—September 16, 1887.

PATENT OFFICE

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ROYAL CORNWALL POLYTECHNIC SOCIETY.

The fifty-fifth annual Exhibition was opened on Tuesday, September 6th, at the Polytechnic Hall, Falmouth, and Lord Robartes, in his presidential address, said that he was informed that the Exhibition of the present year would bear very favourable comparison with many of its precursors. After referring to the various departments of the Exhibition, he remarked, with regard to photography, which was in charge of Mr. Brooks, who took a great interest in the Society, that this department was in advance of previous years in portraiture; J. Byrne receiving the first silver medal for his untouched portrait of the Hon. Fred. Tollemache, and J. Lafayette also having an excellent portrait of the Countess of Londonderry, to which has been awarded a second silver medal. The speaker also referred to other exhibits to which awards had been made (see News of last week), and at the conclusion of his speech, he said it had been proposed to present an address to the Queen in this year of Jubilee. Pendarvis Vivian seconded the motion, which was carried unanimously.

The photographic department was illuminated in the evening by the Incandescent Gas Company (of London), and looked to better advantage than ordinarily, the light being whiter than ordinary gaslight.

The Judges' report is as follows:—

The Judges again have great pleasure in congratulating the Society on the great superiority of the exhibition in this department over preceding years. In portraits the exhibits are above the average in numbers, and also in quality. Many of the specimens are of large dimensions, and far surpass anything that has hitherto been exhibited. There are some life-size examples taken direct. In landscapes by professional photographers the exhibits are, perhaps, not quite up to the number of previous years, but the examples are of the highest order. In instantaneous photography there are some marvellous examples of birds on the wing, &c. In composition pictures there are some very clever and artistic productions. In the amateur section there are some perfect gems of photography, and quite on a par with many of the professional productions, which speaks well for the energy displayed. In specimens of interiors little or nothing is exhibited. In the photographic appliance department there is a falling off.

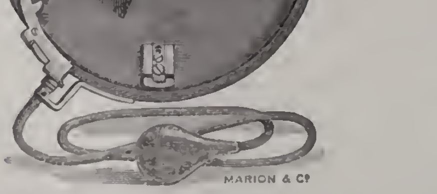
Professional Section.—No. 603, "A Study of Trees" by J. Mulman Brown, an old exhibitor, possesses merit, and is highly commended by the Judges. 590, "Landscape and River Scene at Derwentwater," by T. A. Green, has been awarded the first silver medal as the best landscape in the Exhibition. It is printed in platinotype, and is a striking production, and of a kind that is seldom seen; the atmospheric effect is extremely fine. The same gentleman has several other exhibits which are well worthy of notice. B. Wyles (of Southport) has several other meritorious productions, and Geo. Jones contributes a very amusing picture of some dogs, also several cloud studies; the latter, in the opinion of the Judges, are printed a little too deeply to be effective. 617, "Carolling," by H. P. Robinson, must rank amongst that gentleman's works as one of the most characteristic; it is printed in a sepia tint. E. T. Shelton sends a very good enlargement, "The Morning Tub," a little child about to take its bath. W. Crooke contributes some enlargements in platinotype which are very effective. A. G. Gibson (of Penzance) sends some of his excellent studies, the most striking being a picture of two Newlyn fishwomen. Werner and Son send some very fine portrait studies well worthy of notice, and J. Geddes sends two pictures—"The Blacksmith," as a composition, is admirable. West and Son again send some of their yacht pictures. W. Winter (of Derby) again sends some of his well known work. Luke Berry is represented by some clever studies. No. 666, "Preparing for Boxing Night," composition picture by F. Whaley, is a picture of merit. Being an interior the figures quite carry out the idea of what they are intended to represent, and the accessories are well in keeping. To this picture has been awarded a special first bronze medal. The same exhibitor has several other high class productions. Johnson Bros. (Henley-on-Thames) have some good examples of instantaneous photography of Henley Regatta; they have also two enlargements which are good. T. G. Whaite sends some very high class portrait studies well worthy of careful inspection, and John Pike shows some good specimens of careful work; while R. W. Robinson contributes a number of small pictures which are very clever, but rather too small to tell well at an exhibition. Warwick Brookes (of Manchester) receives a first bronze medal for his frame of direct portraits, life-size, No. 708, which are very effective. W. England (of London) sends some small instantaneous pictures taken on a tricycle which are very perfect and natural. Messrs. Morgan and Kidd have been awarded the medal for enlargements, viz., first bronze.

Amateur Section.—The Reredos, All Saints, Stoke Newington, a picture by Dr. Alabone, has been awarded a first bronze medal; it is a very elaborate piece of work, and is well rendered, being full of exquisite detail. The same exhibitor has several river scenes, which are somewhat heavy, and the sky parts being all white tends to make them look hard. With more exposure, they would make capital pictures, as the subjects are well chosen. F. M. Puddicombe, R.N., also sends some well selected scenes, but some of them are somewhat heavy, a defect that seems mostly due to the printing, and the same exhibitor has a well-defined flash of lightning, which is very curious. The best pictures in this department are W. H. Hyslop's yachting studies. He has some of large size, which are undoubtedly the best examples of yachts in the exhibition, and he is clearly in advance of the professionals in this special branch. They are very soft and delicate, and with good atmospheric effect. F. K. Harman sends several good studies. A. I. Leeson also has a nice little picture, while W. J. A. Grant this year is more varied in his selection, which is an advantage. His Irish cabin is a beautiful little picture. He has also several well chosen subjects with figures, but the best of his exhibits are two frames of portraits taken in a drawing room, and are finer than many taken in a studio. A first bronze medal has been awarded to frame 748, the figures in which are very artistically posed, and the rendering of the drapery is perfection. W. Clement Williams sends a selection of out-door pictures, which show great taste and skill. Rev. H. B. Hare takes the landscape prize this year, a first bronze medal for a capital picture, "Thirsty Moments," a meadow and river with cattle; it is a charming little picture, and is very soft, and at the same time brilliant, with sufficient force and vigour. George Davison has some clever little sketches, mostly figure subjects, most of which are very comical; but each one tells its own tale. The picture "Coal-heavers" has been awarded a second bronze medal. The same gentleman has also several rural pictures which show great talent and artistic taste. H. G. Crocker, R.N., sends several clever river studies which show careful manipulation. R. Hansford Worth contributes several outdoor groups, which show good manipulation; the groups are well arranged, and have a very natural effect. The Dewerstone is a pleasing little picture.

LEISK'S SKY SHUTTER.

From Marion and Co. we receive a well-designed disc shutter, which is made of ebonite for lightness, and by which the operator may, if he pleases, give a much shorter exposure to the sky than to the foreground. On the other hand, by cutting out the opening, the exposure may be made equal for all parts of the subject, and, after this, any required adjustment may be made by partly covering the opening with gummed orange paper.

The accompanying cut shows the appearance of the front of the apparatus, adjustment to the lens tube being by means of a collar and set-screw (not shown). A spring can be wound so as to give (in the instrument sent us) any exposure, from about one twenty-fifth of a second downwards, and by bringing the catch B into play, and making the pressure on the pneumatic pear momentary, the shutter may be stopped at full open, to be again closed by a second pressure.



POISONING BY SALTS OF CHROMIUM.

Now that the salts of chromium play such an important part in numerous photographic methods carried out on a large scale, and considering how many well marked cases of disease have been distinctly traced to these salts, it is rather surprising to find an American surgeon, T. Glenn, contending in the New York periodical *Science*, that there is no reliable evidence as to the mischievous action of chromium compounds. Our English carbon printers have abundant evidence in this direction; still it is very interesting to quote some instances referred to by Dr. Charles Harrington, of the Harvard medical staff, in reply to Mr. Glenn; and those readers who use chromium salts will gather quite enough to make it incumbent upon them to take all reasonable precautions against the absorption of chromium salts, either by themselves or those whom they employ. Dr. Harrington says:—

Wharton and Stillé (*Medical Jurisprudence*, 4th ed. vol. ii., Philadelphia, Kay & Bros., 1884) say of bichromate of potassium, "This salt, being extensively used in dyeing, has given rise in several instances to accidental poisoning. Locally applied, its action is irritant, causing in the workmen who use it troublesome sores and ulcerations upon the hands. Taken in poisonous doses internally, its action is highly irritant also, and death has been caused by it with the symptoms usually attending the action of irritant poisons. . . . . Several fatal cases have occurred in Baltimore." A number of cases are reported in detail. "Experiments upon animals have shown, that, after the subcutaneous injection of chromic acid, animals suffer from vomiting, diarrhœa, albuminuria, and finally die in a few days: after death inflammation of the kidneys is found. The same results were produced by the injection of a neutral chromate (yellow chromate of potassium)."

Taylor (*A Treatise on Poisons*, London, Churchill) says, "There can be no doubt that bichromate of potassium is an active poison," and quotes the following case from Beck's 'Medical Jurisprudence,' which is also quoted by Stillé: "Dr. Baer, of Baltimore, has reported the following case. A man, in drawing off a solution of the bichromate by a siphon, accidentally received a small quantity into his mouth. In a few minutes he perceived great heat in the throat and stomach, and this was followed by violent vomiting of blood and mucus. The vomiting continued incessantly until his death, which took place in five hours. On dissection the mucous membrane of the stomach, duodenum, and about one-fifth of the jejunum, was destroyed is patches. In this case the salt acted as a corrosive irritant."

Schuchardt (*Maschka's Handbuch der gerichtlichen Medicin*, Band ii., Tübingen, 1882) says, "Poisoning by chrome compounds (including lead chromate) is not rare. The chromic-acid compounds are more or less violent poisons." Reference is made to numerous cases. "According to the researches of E. Pelikan (*Beitrage zur gerichtl. Med. Toxikologie und Pharmakodynamik*, Würzburg, 1858), bichromate of potassium is very similar in action to arsenic and corrosive sublimate. It causes, when taken into the stomach, marked inflammation of the same and of the intestine; easily causes vomiting, and, after absorption into the system, calls forth a train of general symptoms, particularly albuminuria and hemorrhage from the kidneys, and causes death with more or less rapidity." Reference is made to the results of the observations of Gergens (*Arch. fur experiment. Pathol. u. Pharmakol*, Band vi., 1876), Weigert (*Die Bright'sche Nierendegeneration vom pathologisch-anatomischen Standpunkte*), and Kabierske (*Die Chromniere*, Breslau, 1880.) The experiments of Gergens were repeated by Posner (*Virchow's Archiv fur pathol. Anat.*, Band lxxix., Heft 2), with the same results. "The action of this poison on the general system is extraordinarily rapid and intense."

Falck (*Lehrbuch der Practischen Toxikologie*, Stuttgart, 1880) says, cases of poisoning by compounds of chromium are not rare. We find reported up to the present time (1880) seventeen cases, of which three were from chromic acid, two from the chromate and twelve from the bichromate of potassium. Of the seventeen cases, nine (or 53 per cent.) ended fatally. . . . . Workmen in dye-houses who have to deal constantly with solutions of chrome compounds are afflicted with painful deep ulcers on the hands, which heal with great difficulty; similar affections may be produced by the same substance in the form of dust. . . . . Experiments on the effects of chromates on animals have proved the intense poisonous action of these substances. According to

Gergens, rabbits died after the subcutaneous injecion of 0·26 of a centimetre of chromate of potassium, and showed hyperæmia of the intestinal tract, nephritis, and cystitis. According to Priestley, the vaso-motor centre is first excited, then paralyzed. Mayer found chromium in the blood, heart, liver, and kidneys."

Many more authors could be quoted on this point, but the above is, I think, enough; and, furthermore, the evidence quoted is a sufficient reply to the negative evidence of the weavers in the Philadelphia mills, the dyers, and bichromate-makers interviewed by Mr. Glenn. With regard to the cases reported by me as being caused by chrome mordants, I wish to say, in the first place, that they were not reported for the purpose of beginning an agitation against the use of bichromate as a mordant, nor was it my idea to cause needless alarm among the people. The paper was written for a medical society, and was intended to call to the attention of the members a possible cause of affections of the skin, the removal of the cause in any given case being of a certain value in treatment. I am very well aware of the great value and importance of the bichromate as a mordant, and also of the fact that to the vast majority of people clothing dyed by its aid is not likely to produce any injury under ordinary circumstances; and any idea of restricting its use as a mordant on account of an occasional idiosyncracy would seem to me so absurd as to legislate against railroads on account of the possibility of accidents. I have worn, as have others of my acquaintance, clothing (including stockings) dyed with the aid of bichromate, without experiencing the least injury therefrom, and the same is undoubtedly true of thousands of others; but neither these facts nor Mr. Glenn's experiments are conclusive evidence that everybody is exempt. The grounds for concluding that the trouble in these cases was due to the mordant seem to me to have been justifiable. Mr. Glenn says on this point, "It would have been strange if he had not (found chromium), since most cloth is chrome-dyed. Had he examined further, equally certain he would have found iron, cellulose, keratin, and some other organic products. Why not assign to one or all of them the maladies of the patients mentioned?" My experience in the examination of cloth for irritants has proved to me that a very large proportion of textile fabrics do not contain chromium in any form whatever, and it therefore never strikes me as remarkably curious in such examinations to find no chromium. In the examination of the specimens in question, no other substance was found which could in any way whatever be considered poisonous. Chromium, then, being the only substance present which is known to act as a poison in certain combinations, was the only substance which could be reasonably suspected. Anybody who has read the original article will, I think, concede that in each case the disturbance was due to something in the cloth. That the conclusion that this something was a compound of chromium was correct, I have very good confirmatory evidence. A young man purchased a cheap pair of trousers, which he wore all summer without drawers, and without perceptible injury. Becoming faded, he had them dyed a dark blue, and shortly after, resuming them under the same conditions as before, he was troubled by an outbreak on the skin of both legs, with irritation and inflammation of a very intense character, particularly on the inner side of the thighs, and about the generative organs. Through the courtesy of his physician, I was enabled to make an examination and inquiry, which brought out the fact that the dyer had used bichromate of potassium. The young man had worn the trousers a whole summer without injury, but had suffered intensely from wearing them after they had been dyed with bichromate. Would it, perhaps, be as sensible to ascribe the symptoms to cellulose or keratin?

I cannot see the application of Mr. Glen's calculation of the loss in weight undergone in a week by a small boy's suit, and of the probable amount inhaled by the wearer, unless he assumes that in the cases reported in my paper the poison was simply inhaled. In these two cases the clothing gave off large amounts of dust, much of which was conveyed to their mouths by wet fingers. Mr. Glenn's figures (that is, that a small boy's suit loses three hundred and forty milligrams in a week) can hardly be taken as a fixed standard, since the amount of loss will depend much on the particular kind of cloth, and upon the activity and habits of the wearer; and in such calculations it is to be considered that small boys occur in several sizes.

Mr. Glenn's theory of antidotes is in great measure correct, but it must be remembered that many so-called insolubles are soluble in the juices of the body. He goes on to say, "Chromic acid is a very active oxidizer. In contact with organic matter, it is quickly reduced to chromic oxide (a compound insoluble in any of the juices of the animal body). It is a destroyer of organic tissues, therefore the action of both normal and acid alkali chromates is similar to chromic acid. They destroy organic matter by oxidizing it, chromic oxide being precipitated. . . . . When such dust falls upon the mucous membrane, it is quickly reduced by the secretion it finds there, and chromic oxide is precipitated. The membrane is not attacked."

This theory of action is not the one which is held by those who consider chromic acid and chromates true irritant poisons, and as one of the latter persons I am obliged to dissent. I cannot agree with Mr. Glenn as to the general effect or the local reactions. Wharton and Stillé (*Medical Jurisprudence*, 4th ed. vol. ii.), quoting a case of poisoning by the bichromate of potassium, in which, among other symtoms, suppression of urine occurred, remark, "The suppression of the urine is probably due to inflammation of the kidneys produced by the chromic acid." Falck (*Lehrbuch der practischen Toxikologie*, 1880) quotes a place where violent vomiting and intense abdominal pain occurred soon after the application of chromic acid to a cancerous breast. The patient lay pulseless, with cold skin and cyanotic face, constantly vomiting, to all appearances like a case of Asiatic cholera. Death occurred after several hours. A similar but non-fatal case is reported by Bruck.

These symptoms indicate absorption into the system, and not a mere local oxidation with precipitation of a harmless oxide. The symptoms in most of the reported cases of poisoning by chromic acid compounds are very similar to the above; and these cases of Mosetig and Bruck are particularly valuable in that the poison was not swallowed, but absorbed from a broken surface.

Speaking of the deaths in Philadelphia following the ingestion of buns coloured with chrome yellow, Mr. Glenn remarks, "No one familiar with the oxidising action of chromic acid salts, and accustomed to making combustions with lead chromate, would find much difficulty in believing that the small quantity of lead chromate taken by any one victim was reduced while in contact with organic matter in the stomach and intestines, chromic oxide passing out with the dejecta, and lead oxide being left to produce its cumulative effects." Again I cannot agree with him, and I think he would have no difficulty in finding many others who would refuse to believe that the poisonous effects of lead chromate are always due to the lead alone. Schuchardt says in *Maschka's Handbuch*, "Chromate of lead appears to act as a corrosive poison;" and again, "Chromate of lead appears to act more powerfully than the acetate." Wharton and Stillé say, "Although this substance is insoluble in water, and under many circumstances in the stomach and intestinal fluids, sometimes it gives rise to acute poisoning owing to its decomposition after it enters the body. That such a decomposition does occur, and that the chromium may be absorbed, is shown by R. C. Smith (*Brit. Med. Journ.*, 1882, p. 8), who reported a case in which chromic acid was detected in the urine: this was a case of professional poisoning, the patient being employed in weaving yarn coloured with chrome yellow." I will briefly quote another case bearing on this point, reported by Leopold (*Vierteljahrsschrift fur gerichtl. Medicin und offentl. Sanitatswesen*, Band xvii. 29). Four persons engaged some days weaving blankets coloured with lead chromate were seized with symptoms of chronic lead poisoning. During the work the yarn gave off so much dust, that their faces and hair were quite yellow. A two-weeks-old boy was kept in the same room, but was apparenty protected by a covering of white woollen cloth. After seven weeks the child became suddenly very sick. Among other symptoms, it had several yellow diarrhœic discharges daily, with restlessness and frequent screaming, during which it dug its hands under the pillows. At first it would drink, but refused food: later on, it drank with some effort, and on the day of its death swallowed with difficulty. The lips were dry, respiration quickened, and death came slowly. On chemical examination after the autopsy, lead chromate was found in the respiratory tract and œsophagus, showing that the cloth had not been a sufficient protection. The rubber nipple which the child had used was found to be free from chromate, most probably because the dust which had adhered to it had been sucked off and swallowed. Among the post-mortem appearances was a perforation of the wall of the stomach. The death of this child was caused by exhaustion following perforation and softening of the stomach, brought on in consequence of swallowing chromate of lead. Neither the symtoms nor the post-mortem appearances could be ascribed to the influence of lead. Part of the chromate in the body was doubtless decomposed, and perforation followed. I agree with Mr. Glenn, that, "if dust from chrome-dyed yarn has any poisonous effects, weavers ought to have some knowledge of it."

Dr. Von Linstow (*Vierteljahrsschrift für gerichtl. Med. u. öffentl. Sanitätswesen*, Band xxi. 60) reports two deaths occurring in boys, aged respectively one and three-quarters and three and one-half years, who together ate six small objects made to represent bees, each piece containing 0.0042 of a centigram of chromate of lead. Both were seized with the same violent symptoms at the same time, a few hours afterward. Among other symptoms may be mentioned diarrhœa, convulsions, stupor, great thirst, and difficult deglutition. The younger child died on the second, the elder on the fifth, day after seizure. Among other post-mortem appearances observed in the elder child were destruction of the mucous membrane of the stomach in several places, and ulceration, and perforation of the duodenum. In both cases there was fatty degenaration of the liver. In the younger child there was no perforation, but the mucous membrane of the stomach was marked throughout with red points, and showed velvet-like, opaque swelling. The duodenal mucous membrane was pale, with occasional bloody points. Would anybody think of ascribing these symptoms and post-mortm appearances to lead oxide?

HUSNIK'S PHOTO-MECHANICAL PROCESS—THE "GELATINOTYPE."

Professor J. Husnik, of Prague, has just described a photo-mechanical printing method in which a relief film of hardened gelatine replaces the wood or metal of the usual typographic relief block, and he styles the new method of printing "Leimtypie," a term which could hardly be taken over into English without translation, as the syllable "Leim" would be misunderstood. We therefore translate the word as "gelatinotype," this appearing preferable to such a name as "gluetype."

The gelatinotype of Husnik is a method in which a film of bichromated gelatine is exposed under a negative translated into line, grain, or network, after which the film is mounted on a rigid support by the exposed side (as in carbon printing); when those portions of the gelatine which remain unacted on by light are removed by solvents such as warm water, or saline solutions which can dissolve it at the ordinary temperature, the action of the solvent being assisted by a gentle brushing.

It is said that the results surpass those obtainable by the zinc method, and that the development of the film only takes about three minutes.

CAMERA MAKING IN JAPAN.

BY W. K. BURTON.

In considering what to write home from a foreign land one can only assume that what has interested oneself will interest others. It is on this assumption that I write about camera-making in Japan. I take myself a very great interest in observing the use of tools of almost any kind, and in noticing the difference in the method of use by different people; and as the manner in which the Japanese use many tools is totally different from anything I have been accustomed to see, it has been particularly interesting to me.

The excursion to the camera maker was made in the following circumstances. An officer of one of the American men-of-war in Jedo harbour having called and introduced himself as an amateur photographer, mentioned that he was having a camera made by Japanese workmen. We decided to go to the workshop and see how the work was progressing, so we made our way to the Regent Street of Tokio—the "Shimbashi," I think it is called; but Japanese names will not stick in my head. Here was the dealer's shop. Most Japanese shops occupy the front part of the ground floor—which is frequently the only floor, the houses being two stories high at the most. The shop is separated from the street only by sliding shutters which are removed in the day time, leaving the whole front quite open. The floor is raised about 18 inches from the ground; it is covered with straw mats; the lighter wares are piled on it, others are stacked round the sides. On the mats sit (or rather "squat," as I described in a previous communication) the whole of the family, every member, as a rule, engaged in some kind of work, for the selling shop is generally the workshop too, and what is to be sold is made on the premises. This particular shop is an exception, however—there is a workshop separate from it.

The dealer has a stock that would do very fair credit to a provincial dealer in England. He has a particularly good selection of lenses, amongst them a portrait lens, the largest but one that I have ever seen. It is only a 6-inch lens, but the brasswork is disproportionately massive. It is of the old-fashioned, very long focus, and is, altogether, a colossal instrument. It is by a French maker quite unknown to me, and as the dealer wants £20 for it, I fear it may be on his hands for a very long time. If, however, any English photographer has a desire to purchase it, I do not mind acting as his agent.

I first attempt to transact a little piece of business of my own. I have left the flange of one of my lenses in England. Has the dealer got one that will fit my lens, or will he make one? Our attempts to express this sentiment in Japanese—with much use of a vocabulary—result merely in "arimasen" uttered with great politeness. This means that he has not got what I want, and we are both equally incapable of explaining—even with the assistance of the vocabulary—that if he has not got one he might make one. We are relieved of our difficulty by one of the University students, who, passing at time, consents to act as interpreter. The dealer says he can make a flange, but adds, with becoming modesty, that he will do it very badly, and that it will take him a fortnight to do. It has taken him more than a month, but I must say, to his credit, that he has made a very good flange. Moreover, he has charged only half a crown for his month's work.

The business in the store finished, we make our way to the workshop. It is on the first floor, up a flight of steps which are something between a ladder and a staircase, and which it would be remarkably easy to fall down.

The workshop is a room perhaps twenty feet square, the floor all covered with straw mats. We are accommodated with chairs. This is an unexpected and certainly a pleasant advantage. We had looked to sitting on the floor, and accommodating our lower limbs as best we could.

And now to give some idea of the manner of working, if possible. There are four carpenters in the shop; each squats on the floor with his bench—or what takes the place of the bench—and his smoking gear beside him.

The bench is nothing more than a flat board of hard wood, the dimensions some three or four feet long, about eighteen inches wide, and an inch thick. It lies directly on the straw mats. The smoking gear consists of a stoneware bowl, which is filled with wood ash, in the centre of which a few embers of charcoal are kept always alight. The bowl stands in a square box, in one corner of which also stands a short piece of bamboo, into which is knocked the tobacco ash after smoking. The pipe has a wooden stem and a metal mouthpiece and bowl, the latter very diminutive. A pinch of tobacco is put into the bowl, the bowl is thrust amongst the live embers, a single puff, or at most two, are taken, the ash is knocked out of the pipe into the bamboo pot, and the smoke is over. The tobacco is the very mildest, and is cut exceedingly fine. I think no Japanese workman is ever without this smoking gear. In his work he pauses every few minutes, takes his smoke as I have described, very deliberately, then returns to his occupation. The smoke is by no means unpleasant, but would certainly be too mild to satisfy certain photographers at home that I could mention.

The bench has no arrangement whatever for fixing the work. It is merely the board of wood that I have described, without any addition whatever. That work should be turned out, on such a bench, of a quality to rival all but the very finest camera work at home, is a thing I certainly should not have believed unless I had seen it. One thing which enables a Japanese carpenter to get on without any arrangement for fixing his work is that he uses his feet as well as his hands.

It is doubtless mostly due to practice, but also in great measure to the foot gear used by the Japanese that they can use their toes to grip in a manner which Europeans could not imitate at all. The foot-gear consists either of straw sandals or wooden clogs—the latter generally mere thick slabs of hard wood—which are held on the feet each by a thick cord which passes up between the big toe and the one next to it, bifurcates just over the toes, and joins the sandal or clog again at each side of the heel. The foot is thus never cramped or distorted as with us, and the toes can be freely used. A Japanese tailor holds his cloth with his toes, and a carpenter holds and turns about his wood with his feet. I was about to say that he manipulated it, but this, I presume, would not be allowable.

The tools are much more simple than ours. The hammer is merely a cylindrical mass of iron with a transverse round hole through which the handle passes. The saw is merely a strip of steel with serrated edge, and with a "tang" whereby it is fixed into a round handle like a chisel handle, much as we fix a file at home. The work is done by the upward or drawing stroke.

The plane is, in general form, somewhat like ours, but the wooden portion is much thinner—shallower from top to bottom—and the knife is inserted much nearer one end than with us. It is unlike our planes in that there is no second adjustable iron, and that there is no wedge for fixing the iron. The iron is just in the form of a chisel, and is held in position by friction against the sides. With the plane, as with the saw, the work is done by pulling or drawing, not by pushing. The knife is fixed near the end which goes in advance as the plane is drawn along. One would suppose that with such a primitive tool only rough work could be done, but the very reverse is the case. I have seen a Japanese carpenter do what anyone who has ever practised carpentry will know is by no means an easy thing. I have seen him take out of the middle of a board of hard wood a thin, delicate shaving several feet long, and the whole width of the plane iron. One reason, perhaps, why such good work is done with the Japanese plane is, that unless the edge of the knife is kept in very good condition the tool will not work at all. It is, therefore, kept as sharp as a razor, a deal of time bring consumed in the very frequent setting of it.

One result of the simple construction of the Japanese plane is that a carpenter thinks nothing of making a special plane for any piece of moulding or such like work that he may have to do. These are sometimes very minute. I have seen them only about an inch and a half long and three eighths of an inch wide. It thus comes that much of the work done by us with guages, chisels, &c., is done by the Japanese with the plane.

None of the other tools that I noticed differed greatly from those used at home, except in being rougher and less finished in appearance.

The work that was being done was merely the exact copying of an English camera and dark slides. At work of this kind the Japanese are very clever, but they appear to have but little capacity for original mechanical contrivance. They moreover have very little idea of saving labour by machinery, or of division of labour. The consequences are that, although they turn out work of the kind that I have been describing cheaply—the camera was to cost about one half what it would cost at home—they would turn it out no more cheaply if goods were manufactured on a large scale. If a thousand dark slides were to be made, each one would be made precisely as the first, one workman doing the whole of the work.

It is probably due to this very fact—to the fact that the Japanese use little or no machinery, and that, as a rule, an article is made from beginning to end by one individual—that we owe the indefinable artistic charm which there is in the commonest product of Japanese labour. It is because each article has something of the individuality of the worker in it.

The camera maker thought it his duty to keep us entertained as we watched the progress of the work, and brought up to us, one at a time, what he considered the greatest treasures of his store. He brought first a fine and very large musical box. It was of French make, but set to play Japanese airs—or music rather, for I have failed as yet to find any approach to air or melody in the Japanese singing or playing. He next produced a Hall type-writer, afterwards various other mechanical toys for our amusement.

The bellows of the camera was being pressed in the selling shop by the simple expedient of piling lithographic stones on the top of it to a height of some four or five feet.

We are already here beginning to look forward to the eclipse which will be total in great part of Japan. I hope to be at one of the observation stations, and to have something to tell English readers of what goes on.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter XII.—Testing Cameras—Testing Tripods—Principles Involved in the Construction of Exposure Shutters.

The idea that the pictures produced by means of a camera are an indication of the value and efficiency of the instrument is very common, but quite erroneous. The simplest and cheapest box of deal or cardboard that will hold the lens and the sensitive plate in their right places and exclude extraneous light, will give in every way as good a picture as the most expensive apparatus.

The best camera is simply the most convenient, but convenient is a very inclusive term. It is not convenient to have a camera that shrinks and swells in a dry or moist atmosphere, or one that is likely to warp or crack. Hence the best workmanship, the finest wood, and the most perfect polishing, are well worth what they cost.

A camera intended for honest work should be rigid in all positions. When extended partially or fully, if the back is seized by one hand and the front by the other hand, there should be no looseness evident, but a sensible oneness, as if the back and front were permanently fixed with no means of adjustment. All movements must run smoothly, and this is especially to be looked to where the back or front slides on runners, a method of construction often adopted in extending base boards or long focus cameras. If such runners are made true by proper planing machinery, they will not cause any sticking or irregularity. The front of the camera must be parallel with the back when both are in their normal positions, and the axis of the lens should be exactly at right angles to the focussing screen and opposite its centre. The inside of the camera should be black all over, including the brass work, and it is well to especially look to the lens-flange and the screws that pass through the front to hold the movable fronts in place, as these parts are often left bright. The balance between strength and portability is a matter that cannot be usefully discussed without practical examples, but it may be stated that a light camera that is properly made will often be stronger than a heavier camera that is inferior.

The register of a camera should be carefully tested, especially where lenses of large aperture are to be employed. For ordinary purposes, a distant object—such as a signboard, a lamp post, or a window—should be sharply focussed on the focussing screen, using the full aperture of the quickest lens at the disposal of the operator. The screen is then turned back, and each side of each double back is by turn brought into its proper place, and a piece of finely ground glass is held in exactly the position that the sensitive plate would occupy in making an exposure. If the image is well defined the register is correct. The same method should be pursued where greater exactness is desired, but transparent screens with fine lines on them should be used, and the focussing done by means of a good magnifier. To focus sharply and then expose and develop a plate is far more trouble, and not so good a method, because the correction of the lens for chromatic aberration is included in the test.

To ascertain whether a portable camera-stand or tripod is fit for use, the largest camera that it is supposed to carry should be screwed to it, after placing the legs in the ordinary position. Then on taking hold of the camera it should feel as if it were one piece with the stand. The legs are generally attached to the tripod top by means of pins in the one and holes in the other, and it is the exception to find the holes to fit the pins. If the legs have sliding extensions, as much pressure should be brought to bear upon each leg as would suffice to drive it into the ground on average pasture land, and the sliding connection should remain firm. Other things being equal, the fewer joints the firmer the tripod; but the other things so rarely are equal that the fewness of joints is no indication of stability. There is probably no firmer tripod of its size than the fourfold tripod of Watson and Sons, and the firmness is due to the exact fitting of the connections obtained by stamping them out with suitable machinery.

The need for exposure shutters has been vastly overrated by extravagant practitioners of the photographic art, and by the makers who profit by such extravagance. It is not uncommon to hear the statement made, "I always use a shutter," and further inquiry generally shows that the individual who makes the announcement is one who "takes shots," as he calls it, indiscriminately. He prides himself on "developing" a large number of exposed plates in an incredibly short time, and he always uses the cheapest plates, because the first cost of the plate is the chief expense of his practice. His energies are spent in making what he calls "negatives;" he does print occasionally, but only to show that his negatives "will print."

A shutter should never be used in outdoor work unless it is absolutely necessary.

Excluding those very useful shutters for studio work which enable the operator to expose without attracting the attention of the model, a shutter is necessary when the exposure required is less than the fifth of a second. An exposure of half a second can be given with the lens cap, and with a little practice even a quarter of a second, but for such short exposures something larger than the cap is to be preferred, such as a flat piece of blackened card or zinc. This is held in front of the lens, and raised to expose and lowered to close the lens with the required rapidity. One twenty-fifth or thirtieth of a second is the shortest exposure required in ordinary cases, for a time less than this rarely gives a proper amount of detail. The most generally useful shutter, therefore, is one that will give exposures from the tenth to the thirtieth of a second, and if a non-adjustable shutter is to be employed, there is little doubt that the tenth to the twentieth of a second is the most useful time to work to.

It is as impossible to conceive of a perfect shutter as of a perfect lens, and it is therefore the more important to realise what is wanted, that minor considerations may give way to what is more important.

The shutter, when in position and fully open, must have no part of it visible when the eye is brought to the place occupied by the extreme corner of the focussing screen when in its place as if a distant view were focussed upon it. Many shutters that work in front of the lens are made to fit the hood, but the opening in the shutter is even smaller than the lens itself. In most lenses the hoods are only just large enough to be out of the way of the light, and the opening in the shutter ought therefore to be as large as the ring that fits upon the hood.

The whole field should be opened simultaneously, that the exposure may be even over the whole plate; or, if one part of the plate receives more exposure than another, it should be that part that needs most exposure, namely, the foreground.

As large a proportion as possible of the exposure should be given with the full aperture, hence the opening and closing should always be as rapid as possible, and the duration of the exposure regulated by the interval. To regulate the speed of a shutter by simply slowing or quickening its action is bad in principle, though perhaps sometimes convenient in practice.

There must be no jarring or jerking until the exposure is quite over.

And, finally, a shutter should be small, that it may not catch the wind; light, that it may not strain the lens, mount, or camera-front; simple, that it may be easily repaired by the user, quickly fixed to or removed from the lens, and need no change whatever in either the camera or lens.

With the usual form of rapid doublet, there are three distinct positions for the shutter—in front, behind, and between the two combinations in the place of the diaphragm; and any shutter will vary in its effect according to where it works. It has been proposed to put the shutter immediately in front of the sensitive plate; the advantage of such a method is not obvious, and the large size of the apparatus needed is sufficient to condemn the principle.

The drop-shutter is largely recommended by practical workers, and it certainly is simple, uniform in action, and free from jar until the exposure is over. But this shutter never gives an even exposure; if in front of the lens, the sky has most exposure: if behind the lens, the foreground has this advantage; but a drop-shutter cannot be worked inside the camera for want of room, and to fit it outside the camera and behind the lens, means either a permanent addition of considerable weight, or an apparatus that requires much adjusting, and is otherwise awkward. The greater the distance through which the dropping piece falls before it begins to open the lens, the more even is the exposure over the whole plate. One great fault of commercial drop-shutters is that the aperture in the dropping-piece is not long enough. Its length should be at least two and a-half or three times the diameter of the lens, that the duration of the exposure may not much exceed the equivalent exposure. The equivalent exposure is the time that would produce the given effect if the lens were fully open, and no part of the time were required for the operations of opening and closing.

In the flap and drop-shutter, the excess of exposure is given in the right place, that is, the foreground; but when the dropping piece has its movement quickened by means of an india-rubber band, there is a very perceptible jar in the middle of the exposure.

There are several shutters made on the "go-and-return' principle, one sliding piece being drawn away to open the lens, and sent back to close it. Whatever jar results from stopping the slide and returning it takes place at the very moment when the lens is fully open. To give the excess of exposure to the foreground, the slide should move up and down if the shutter is in front of the lens, or down and up if at the back of the lens. This principle has been applied to a diaphragm shutter that does not require any alteration of the lens mount, the sliding piece being so thin. A drawback to this arrangement appears to be that a diaphragm cannot be put in the lens, and this is necessary and often advisable, that a gain in marginal definition may be secured when the subject is well enough lighted to allow of it. The "snap" shutter is a modification of the "go-and-return" principle, in which the sliding piece works on a pivot.

Instead of the same slide returning to close the lens, a second slide may be released, and this principle has the advantage that the two slides may be released by means of a disc caused to revolve at a regular rate by clockwork, and that any required time interval between the releases may be secured by adjusting the two releasing catches upon the revolving disc. Addenbrooke's shutter is an example of this principle. In this form of shutter it is usual to make the opening slide fly up and the closing slide fly down, and it will be obvious that if the second slide is released before the first has time to get to the end of its journey, that the upper part of the lens will be covered by the closing slide before it is uncovered by the opening slide, and the upper part of the subject that corresponds will receive no exposure at all. This must be guarded against in endeavouring to get very rapid exposures. Another drawback to this form of shutter is that the opening slide produces whatever jar results from the stoppage of its motion at the time when the lens is fully open; but this principle has the advantage that the efficiency of the apparatus increases with the exposure.

The writer has constructed a shutter that is light, and smaller in proportion than any he knows, by making the two lens-covers to work on a common centre; the falling one that closes the exposure is held up by a sliding support which the rising cover removes.

It is easy to make the lens-cover divide in the middle by constructing it of two jaws like a pair of scissors, as in Watson's double snap shutter, or to open from the centre of the lens by drawing two superimposed slides in opposite directions, each slide having a diamond-shaped hole in it, as in Sands and Hunter's. Such shutters placed either at the back or the front of a doublet lens are not to be recommended, for the inequality of illumination resulting from their use is such as to magnify the defect inherent in all rapid doublets used with full aperture. The oblique pencils of light that go to form the margins of the picture are partially cut off by the lens in proportion to their obliquity, and these shutters placed as stated give the residue of the oblique rays a less time to act than those rays which form the central part of the picture. But if, as in the case of one form of the second shutter mentioned above, the central opening and closing is done at the diaphragm place, the shutter causes no change in the proportional illumination of the plate, and actually improves the definition as compared with the result of having the full aperture of lens open the whole time, because the shutter is practically an expanding and contracting diaphragm. Instead of two slides, a flexible material with the two apertures in it may be used by passing it over a roller at one end of the frame of the shutter, and it is stated that such an arrangement is efficient and convenient.

Rotary shutters have much to recommend them, but if efficient they are generally large, and they are often heavy because of the difficulty of getting a light revolving piece to work true. If the opening is bounded by lines drawn from the centre of the revolving disc, and the rate of revolution does not change, the exposure will be uniform over the whole field.

The pneumatic release (J. W. T. Cadett's patent for which is still in force) may be applied to any shutter, and in its simplest form consists of a minute bellows leading from which is a tube terminating with a collapsible ball. By pressing the ball the bellows is inflated, and by its expansion it pushes a lever that turns a spindle, or it pushes away a catch that retains the movable part of the shutter.

The actual duration of the exposure given by some shutters can be estimated by attaching a tuning fork to the moving part, and causing it to vibrate during the exposure, and mark its vibrations on a piece of smoked glass. If an A fork is used, each vibration is equal to the 430th of a second, if a C fork to the 256th of a second. Or by calculating from the known rate at which a body falls, the duration of the exposure given by a drop shutter may be approximately found.*

But we have already seen that the duration of the exposure may be long, while the actual exposure, as indicated by the effect of the light, may be short, on account of an undue time being occupied in opening and closing the lens. The best way of estimating the practical effect of the exposure given by any shutter is to photograph a body moving at a known rate, and measure the distance it passes through during the exposure as indicated by the impression on the plate. The thing photographed should be white against a black background, and if possible in the sunshine. A clock without a pendulum, so that its minute hand moves rapidly; a bicycle wheel with a piece of white paper attached, which can be timed to make one revolution in a second without much difficulty; a white plate allowed to fall in front of a black background graduated in white, are examples of available means of getting what is desired. A lighted taper is easily moved by hand round and round at the rate of one revolution a second, but the light given is far too small to impress a gelatine plate of the most rapid sort.

(*To be continued.*)

Notes.

As a striking contrast with the truthfulness of Mullins' magnificent untouched photograph of the Queen, as described in the News of last week, we may refer to the long-necked burlesque portrait which is to be found upon the new Jubilee coinage. But, bad as the coin portrait is, it is not nearly so bad as the mintage of the coins themselves; indeed, so badly stamped was the first two-shilling piece that came into our hands, that, at first sight, we took it for a counterfeit.

It would seem that the Government has recently taken official cognisance of the badness of the mintage, as now coins of a superior make are offered by the Mint at an advanced price of about twenty-five per cent., these coins of best make being, to use the words of the Chancellor of the Exchequer, speaking in the House of Commons on Thursday, the 8th inst., "struck with great care in the medal presses." If the coins of best make are to be legal tender at the price of issue, there may be a little difficulty in conducting monetary transactions with them; while if they are to pass current at less than the price of issue, our coinage will be discredited, as in the time of some of the earlier monarchs. The above is, however, a matter which may perhaps be cleared up by questions in the House of Commons; but the worst part of the system of issuing badly-stamped coins and well-stamped coins side by side is the great facility offered to the counterfeiter, who, by taking a coin of best make as his model, must indeed be clumsy if he cannot produce as well-moulded an article as the very badly made coins now issued at par.

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* Disregarding friction, a body falls inch by inch in the following fractions of a second:—1st inch in ·0714 secs.; 2nd inch in ·0277 secs.; 3rd inch in ·0232 secs.; 4th inch in ·0192 secs.; 5th inch in ·0169 secs.; 6th inch in ·0154 secs.

While on this subject, we may as well tell our readers how to make a hard steel die from an original in a soft metal, as silver, copper, or gold; or indeed from an electrotype relief made by a photographic process, a method which will enable the photographer to supply steel dies of any subject to the order of his customers, or which will, we are sorry to say, enable any engineering workman of moderate skill, to construct—by using as models the best make of coins now issued—real steel dies which will serve for stamping silver coins equal in metal and workmanship to the second-class Mint work: a transaction bearing a large profit now that silver is cheap.

The original, whether a coin or a photo-electrotype—say a cast of a Woodburytype relief—is placed at a little distance from a mass of tool steel heated until soft and doughy, when, by a sudden push or blow, it is forced into the soft steel; the action being so instantaneous that a wonderfully perfect cast is made without melting or even damaging the original. This process, which is quite analogous to the old method of making a leaden cast from a sealing-wax original, is carried on commercially by the Patent Die Company, of 8, Princes Street, Stamford Street, Blackfriars, and many of our readers wishing to have steel dies from electrotype originals may find it more convenient to go to this firm than to do the moulding in steel themselves. Of course we need scarcely say that the firm in question would not reproduce a Mint coin without an order from the issuing mint.

Moulding in steel from photographic originals by the method indicated above may have very many applications. Signature or portrait stamps may be made for stamping hard goods, and perhaps even letter punches could be produced for type-founders by this method; thus ensuring greater exactness to the original design than in the case of the usual cut punches. Again, chasing punches for ornamenting jewellery or other metal work can very easily be made. The electrotype should be placed on an anvil, and one end of the steel being made hot, it is struck down on the electrotype by a blow of the hammer, after which the punch is trimmed with a file, and hardened.

Photography in the suburbs is not improving, from a commercial point of view. We were informed the other day, by the proprietor of a well-appointed establishment situated in the main thoroughfare of a very populous district in the north-east of London, that the present year is the worst he has ever experienced. "How do you account for it?" was our natural inquiry. "The only cause I can see," he said, "is the excessive competition of the big men who have gone in for the club system. This is an essentially middle-class neighbourhood, within easy reach of the city, and I suppose three-fourths of the people are employed in the large warehouses. There are hosts of young men and young women—the class from whom we naturally expect the most custom—but the local photographers do not see much of them. You see, in the warehouses where they are engaged, there is generally someone in the pay of a club photographer, and nothing is easier than to induce them to join. In the first place, there is the example of those who have already been photographed—and an example of this kind is catching; and then the payments are easy, and, what is half the battle, can be collected without trouble. It is not too much to say that the club men have ruined the trade of other photographers—at all events, in neighbourhoods such as this. Probably, in the western suburbs, they have not had so much influence."

There would seem to be some truth in this. As for the remedy, that must come from the public itself. The usual club portrait is, as a rule, not a thing of beauty. The conditions under which it is produced render it unlikely that it should be so. The sensation of being one of a "batch" is not condusive to self-respect, and we are inclined to think that the monotony, the stony, inanimate looks which mark the majority of these club portraits, are due to this cause. The club photographer also has a tendency to regard the whole thing as a purely commercial transaction, into which art only finds its way by accident. The way he goes about his work is terribly suggestive of having one's hair cut, and you almost expect to hear the words, "Next, please," drop mechanically from his lips. Doubtless, he has a standard of excellence, and there is no reason to suppose that he does not strive conscientiously to maintain that standard; but when sharpness of focussing, absence of movement, a clean negative, and a well-burnished print have been attained, he is satisfied.

The work, in a word, is mechanical and uninteresting. There may, of course, be exceptions, but these are the usual characteristics of the club portrait. Nor can it be said that the public is dissatisfied. Still, one does not go to the public—that is to say, the public who patronize the club photographer—for a craving after refined taste and artistic skill, and this satisfaction does not count for very much. It may also be urged that for "five shillings a dozen" one ought not to expect all the virtues. True; but the natural question is, Why do photographs at five shillings the dozen? But now one is met by the crushing rejoinder, "We must live!" and to this nothing is to be said save the famous reply attributed to Tallyrand. Unfortunately, though the existence of the club photographer may not be a necessity, the problem is not solved.

It is really time that photographic "business" in plays should be brought up to date. What was good enough for the audience of twenty or twenty-five years ago will not do now-a-days. Boucicault's play of the "Octoroon" contains a supremely absurd situation, which always passed unnoticed, save by the initiated; but the revival of the "Octoroon" at the Alexandra Palace last week proved too much for some of the audience, who were evidently amateur photographers. Boucicault's idea is that the camera should accidentally be made to witness a murder, and record the scene. This in itself is difficult enough to imagine, but supposing one is able to swallow it, what is to be said of the miraculous development of the plate within the camera, without dark room or developer? The sight of a negro rushing to the camera, extracting the plate, and holding up a full-blown picture of the murder, tickled the fancy of a section of the audience immensely, as the suppressed titter fully showed.

A handy guide for amateur artists who attempt pen-and-ink drawings for reproduction by photography is sadly needed. For the want of a little elementary knowledge of the requirements of the camera, an artist the other day came sadly to grief. He had drawn some portraits which looked exceedingly well on the card, but when they appeared in the periodical, he was horrified at their appearance. All his light lines, which were so delicate in the original, were as heavy as his dark ones, and the consequence was one or two of the faces looked as if they had been put up the chimney. Of course he laid the blame on the "process," and was rather taken aback when it was shown conclusively that the fault was his own. The fact was, that while he had made his light lines grey, he had made them thick as well. Photography ignored his gradations of tone, and remorselessly reproduced his thickness. Hence his failure. He will probably benefit by the discovery that gradation in photographic reproduction must be procured by relative thickness or thinness of lines, and not by degrees of tint.

With young children it is sometimes difficult to tell, owing to similarity in dress and arrangement of dress, which is a boy and which a girl, and some cautious persons in the case of babies adopt the plan of calling the child "it." When children are photographed, the difficulty is increased rather than diminished. A case in point occurred last week at the Marlborough Police Court in connection with a charge of abduction of two children brought against their aunt. An old woman was called to prove that she had seen the children come out of the defendant's house, and the photographs produced, she said, were those of the children she had seen; whereupon the defendant's counsel, handing her one of the photographs, asked, "Is that the boy, Mrs. Lane?" Witness looked at the photograph and glibly replied, "Yes sir." "Ah!" said the Counsel, "then this happens to be the girl." Of course this was awkward for the witness, but for the reasons already stated, much is to be excused her. Photographs of young children, to prevent mistakes, should really be labelled like the stage scenery in Shakespeare's time, "this is a boy," or "this is a girl," as the case may be.

Photographs of a leaping horse have been taken at the Cavalry School at Saumer by M. Wœlker, and two of the pictures have been reproduced in last week's *Cosmos* (Paris). The writer of the text accompanying the picture gravely remarks: "The painters who will consult photographs of this nature will no longer fall into the errors, so often repeated—seen in the English pictures and engravings representing horses leaping." Probably not, but for all that, we take leave to doubt whether anyone, French or English, has ever seen a horse, when leaping a fence, in the position indicated by M. Wœlker's second picture. The right leg is planted perpendicularly on the ground, the left is bent as in the act of trotting; the two hind legs on the other side of the rail are disposed as in a gallop—anything less like leaping cannot be imagined. M. Wœlker's photographs are of course correct, but so is the painter. The painter paints as the eye sees, and not as the camera, with its 250th part of a second's exposure, represents. Why should the two operations be confounded with each other, when both, though so different, are right?

CARBON PRINTING: EXPLICIT INSTRUCTIONS FOR PROFESSIONAL AND AMATEUR PHOTOGRAPHERS.

BY MAX BOLTE.*

Printing.

Alum Bath.—This bath is composed as follows for single transfer—

Finely powdered alum	3 to 5 ounces
Water	100 ,,

If the water should be calcareous, which would make the solution turbid, from 3 fo 5 drops of sulphuric acid must be added. For double transfer the solution should not contain more than two per cent. of alum. This solution must be filtered repeatedly before use, and as long as it keeps clean may be used over and over again; however, it is better always to use a fresh bath.

The alum bath cannot be dispensed with, for it not only hardens the gelatine, but eliminates any trace of the bichromate which might still be present, and which, if not neutralized, would impart an ugly greenish colour to the picture. The developed and well-rinsed pictures are placed for from five to ten minutes in the alum bath, and afterwards for at least thirty minutes in a tray containing cold water, from which they are removed, rinsed again in cold water, and hung up to dry. The carbon picture when dry loses all its relief, and becomes rather resistant to any rubbing; it even requires a little pressure to attack it with a scraper.

Reticulation.—Unfortunately very often during hot weather this trouble makes its appearance. The picture on development appears to be covered all over with a fine black net-work which destroys its delicate appearance, and (holding the picture horizontally against the light) looks as if it had lost all its gloss. This defect can be produced at will by the carbon printer, for it is only necessary to immerse the carbon paper, when effecting the transfer, in water of 88° F., instead of cold water. Therefore, to avoid it, employ water of not more than 58° F., and use an ample supply in the tray, always keeping the paper under its surface. The warmer the weather the cooler must the water be for the transfer operations. The addition of salicylic acid to the sensitizing bath, as already indicated, has been recommended, and generally produces a good result. Too strong sensitizing baths during warm weather also cause reticulation.

Retouching and Mounting.—The retouching of the picture is easy. It is first rubbed over with finely powdered cuttle-fish bone. The stone should be charged with finely ground lamp black and carmine, or, still better, *caput mortuum*. The scraper can be used to produce bright high lights. After successful retouching the picture is rubbed with a soft flannel tuft soaked in the following solution—

White wax	1 part
Warm benzine	10 parts

Do not use till cold. The pictures allow of being burnished, and may be rubbed before or after; burnishing first, and applying the wax lubricator later, gives a better result. The mounting may be done in the usual way on Bristol board, but care must be taken that the paste does not touch the picture side, for it would not be easy to wipe it off, since the carbon print, when moistened, becomes rather delicate. When in the right place, cover it with a piece of stout paper, and rub down well to ensure good contact with the cardboard.

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* Continued from page 556.

Double Transfer Process.

The lighting of the room, exposure of the tissue to the light, &c., are all the same as for single transfer, but as the picture comes right, no reversed negatives are required. The entire process can be summarised as follows.

The exposed carbon tissue is placed in cold water, pressed on to a glass or porcelain plate which has previously been rubbed with waxing solution, developed with warm water, passed through the alum bath, dried, again placed in cold water, and pressed into contact with the double transfer paper, and when perfectly dry, separated from the plate. This process furnishes pictures with a high gloss.

Ordinary glass plates can be used, but if really fine work is desired, it is necessary to employ French glass of from 4 to 5 centimetres thick. Beginners do better to use opal glass, for, as it is white, the intensity of the print is far easier seen. It requires some practice to be able to estimate the strength of a carbon print on glass. Ground plates furnish prints which are "matt," *i. e.*, have a finely grained appearance. The carbon picture takes exactly the same character as the support employed, and special care must be used when selecting the plates, for any scratch or defect in them will show in the carbon print.

Larger sized plates offer a great advantage, for they allow of simplifying many of the operations, and it is just as easy to handle a 10 by 24 plate as a 10 by 8. Of course they require larger developing, transfer, and alum trays.

Having selected a faultless plate, it is first well cleaned by means of caustic potash, and some drops of liquor ammonia fortis, well dried and dusted, and then taking a small piece of flannel, which is slightly dipped into the waxing solution, made as already described, the plate is carefully rubbed all over. After thirty minutes it is laid on a flat board, and by means of a dry, clean piece of white flannel is polished. The polishing must be done with very slight pressure, in order not to rub off the wax, for if this should happen the picture would not separate from the plate. It is best not to polish new plates, but to employ them waxed alone. Be careful never to breathe on a plate while waxing or polishing. Should it be necessary to free it from the wax, rub with a piece of flannel well soaked in benzine. The plates which have been used for transfer do not require any more cleaning; the particles of collodion or tissue which remain on them can be scraped off with a flat table knife. Having waxed and polished the plates, they are now left on the folding rack, being careful to protect them against dirt and dust.

(*To be continued.*)

HOW TO MANIPULATE THE CAMERA IN A MILITARY MANNER.

BY J. A. FORREST.*

In 1858 the dying embers of the Bourbon race as Kings of France were gradually fading out of view, caused by the rebrightening lustre of Napoleon III.

Prince de Jonvile published a pamphlet on the invasion of England. This was intended as a sop to the vanity of the French people, and a leaf out of the book of the First Napoleon. The only effect it had was to rouse the "nation of shopkeepers" to a sense of their insecurity. The British nation suddenly awoke, and their force of action was altogether independent of statesmen or legislators. Local corps of volunteers sprung up in every quarter of the country, calling upon Government to give them instruction in the use of instruments of war, and coupling it with a motto that "Defence, not Defiance," was their aim. "The Auxiliary Forces" have now taken root, existing for no less a period than thirty years, and may be said to be a permanent institution.

In the month of May, 1859, I became a member of the First Cheshire Volunteers, and underwent the process of drill, and in the course of a few weeks afterwards had the honour to present arms to the Queen and Prince Albert as they passed through Chester to the seat of the late Lord Penrhyn. I was then an ardent disciple of the collodion process. During the Crimean War in 1854, Government sent out Mr. Fenton to photograph the scenes of the war, and his pictures sent home gave a vivid idea of what a terrible thing war really was. For forty years peace had lulled us to a false repose, and the old veterans of the age of the First Napoleon, with their experience, had nearly died out. We found we had the men, but we had lost our Wellingtons and our Nelsons as leaders of a heroic band. In later periods, the Americans, during their war, made the camera do great and good work. Mr. Skaife, an enterprising inventor, about the same time brought out a Pistolgraph that gave pictures one inch square—enlargements were not much in vogue in those days—and after a short popularity it died amidst a galaxy of attractive novelties.

Military drill has two advantages in a photographic sense: firstly, its exercise of judging distances; secondly, rifle drill up to three hundred yards from the shoulder, and, after this distance, in kneeling position—thus giving a firm set to the body in process of firing. There are also considerable advantages in looking steady at the target before raising the rifle to the shoulder.

Now to carry this out photographically with the camera, having undergone the necessary drill, you must provide yourself with a "finder," which almost every amateur possesses, on the focussing glass of which you must draw lines in squares, so that each square will represent one square inch of the sensitive plate, keeping the centre object as the centre of the picture, having previously engraved on the flat rack of your camera the exact points of focus, say, up to thirty yards, for after that there is truly no focus. Lock the distance determined upon with the thumbscrew of the horizontal bar, uncover the dark slide, shoulder the camera, observe the focus of the finder and the relative size of the picture to the squares already described, and fire your Kershaw shutter, or any other of a light character, and the object is secured.

Rifle practice beyond three hundred yards is carried out by resting the body upon the heel of the right foot, with the elbow placed upon the left knee. This position is irksome at first, but perseverance will ultimately enable you to do it with ease and with the utmost promptitude. This position gives great rigidity and steadiness during the operation of exposure.

To obtain all the advantages of rifle practice, I fix the "butt" of the rifle to the under portion of the camera (through the ordinary stand screw); this beds itself into the shoulder, at the same time giving something for the hand to grip firmly, thus ensuring steadiness of aim, and does not require any alteration of the camera for general work.

It is almost unnecessary so state this plan ignores camera legs. The only additional article you require is an old rifle stock, which can be easily and quickly removed when required, and placed in an outside pocket.

I would recommend camera drill as a health developer.

AN AMATEUR'S IMPRESSIONS.*

Unfortunate is he who falls into the editorial clutches, at a show of photographs, if he is asked to "write out his ideas on the exhibition"—especially if he is fain to answer, "not prepared;" but if in a rash moment he assents, then is he in for trouble in getting out his grist.

The writer had the privilege of examining the photographs shown at Chicago, and jotted down a few of his impressions, for his own use merely; but willingly sets them forth for whatever they may be deemed worth.

The first things to attract the eye were the half dozen life-size full-length enlargements on bromide paper shown by the Eastman Co. Contact prints from the original negatives, in most cases 8 by 10, accompanied the enlargements, and enabled an idea to be formed of the immense amplification. Notwithstanding this, the result was astonishingly perfect, to my thinking, and was enhanced by the tasteful and effective, though simple framing.

Perhaps this will be a good opportunity of saying something about frames and framing at the Convention. An article might easily be devoted to this one point, which assumed especial prominence from the discussions of last year's convention, and the consequent rules for this year's exhibition. The underlying idea was a good one, but impracticable; it was, in a word, equality. Now it is very much open to doubt if there is such a thing as equality among photographers; and the attempt this year to obtain it resulted only in clipping the wings of the more artistic and capable, and showing more decidedly the waddle of those who can't—or won't—fly. The idea or definition or use of a frame seems not generally understood. It is not a thing to put *money* into—a question of so many dollars' worth of gilding, or polishing, or carving; a frame is, essentially, a device for insuring a separation from or a gradation to the surroundings of the thing framed. In this sense, a plain margin of cardboard is a frame.

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* A Communication to the Birkenhead Photographic Association.

* Presented at the Chicago Convention.

Practically, however, we combine, usually, a protecting glass, and a moulding to keep all in place, though these are not essential, as was shown in the case of one large exhibit, in which the photographs were first mounted on a white card, which was in turn fastened to a stretcher, with bevelled edges; both sides and bevels being enamelled white. Now there was no moulding here, but as truly a frame, so far as the effect went, as if four-inch oak was used.

Well, it was very evident that where "frames" are tabooed, the chief result is to leave the majority flat on their backs, so to speak, while the minority, who have taste, so use it that they maintain the same superiority that they showed when all were allowed to frame.

The plan of dispensing with frames added greatly to the labors of those who had the work of hanging to do, and it is certain that the results did not compensate.

Not far from the Eastman enlargements were shown the direct prints on bromide paper made by Nadar, the Parisian photographer. These comprised some twelve or fifteen well-known Frenchmen and women, among them Pasteur and Chevreul. These very strongly resembled mezzotint engravings, and were finely done.

Mr. Treat, of San Francisco, had a few choice prints, apparently on bromide paper, mounted on drawing paper, and showing a "plate-mark," a manner of mounting adding greatly to the effect of certain classes of pictures, such as landscapes.

Guerin, of St. Louis, seemed to prefer heads, mounted on circular or oval bevel-edge mounts of slightly larger size. Two companion groups, a boy and girl in bridal array, are extremely good; the first entitled, "At last, alone!" in which *she* clings smilingly to *his* manly arm; the second, "Where's Mamma?" in which, overcome by home-sickness, *she* weeps lustily on his shoulder, and *he* looks up with the most natural expression of perplexity that can be imagined.

Another large picture, "When the cat's away," shows the coloured assistants practising on each other, very cleverly.

Mr. Landy's picture showed the value of a frame in emphasizing a picture and separating it from its surroundings. It probably attracted more attention than any other one print, and was one of the best things shown—although the title was not a very appropriate one. A monk was intended, from accessories and costume. Call it "A Monk"—very well. Then it becomes natural enough for him to be studying a page or book of music; but *destiny* is not usually therein sought. The rich lamp is also a bit obtrusive and out of keeping; but the whole result is a good one, and illustrates the benefit of concentrating attention and efforts on one thing rather than dissipate it over many.

Mr. J. C. Strauss showed some excellent work. One portrait, that of a stout man, was characteristic enough to make a painting from. A clever study was that of a boy catching a fly on a wall. Only the edge of the face is visible, but the attitude tells the story. These were all framed in a very tasteful manner in a narrow silver moulding, the pictures being remounted on gilt mats.

W. H. Jackson's elegant view of Pikes Peak was greatly admired.

C. W. Elton's excellent cabinet-size portraits were on mounts with India tint, and consequently were effective.

A Canadian exhibitor's pictures showed very queer use of a very nondescript accessory, something like a large folding fan. So that it was included in the picture, it seemed to make no difference what relation to the sitter it had.

Mr. McDonald's work was all mounted on cards without margin and with edge bevelled, then being remounted on maroon cards, producing an excellent effect.

Thors, of San Francisco, showed great originality in pose.

Urlin showed a very fine enamelling; also a very good notion for a "bridal pair," being separate pictures, printed together, one overlapping the other, and the whole print highly enamelled.—*Photographic Times.*

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KILLED BY OVERDOSE.

BY J. F. HYDE.*

The uses and abuses of developing methods in general practice is my subject. I give my impression and my opinion more as an observer than as a handler. I do not expect to tell you anything new, but may attract your attention to my impressions in a manner to get some value, if any be in them.

The formation of the image in the negative plate and the positive paper are operations of such importance that we can hardly learn too much about them.

First, let us consider the negative. You all know that pyro is the developing agent (I say pyro because it is almost universal in this country), and that the accelerator, whether it be ammonia, soda, or potash, is the power that sets the pyro at work. You understand that the pyro produces the intensity in lights or the white parts of your image, and that the accelerator takes care of the dark parts by working up the lower shadows and giving detail and modelling through the lesser ones. You all have your formulas, which you believe in. It is not my purpose to disapprove of any one, but to caution you to a careful use of all.

The exposed plate has an image in it; possibly the image is a landscape, some parts of which lie in full sight, while another part falls in deep shadow, or a clump of heavy, dark foliage occupies the foreground—perhaps it is a room interior, which was dimly lighted, or the portrait of a person taken much in shadow. We are about to call that image into a palpable existence—to make a visible fact of it.

In case of either of the above-described exposures, shall we take the usual formula of proportion—so much No. 1, so much No. 2, to so much water, as printed directions—to be found in every package of plates, says is proper?

Dare we do it? I say no, if we care to find the best results. Now is just the time to go slow, the image can be better coaxed than driven. Take time, be patient, and get your reward. Understand you cannot get your density first and your details afterwards, but *can* first get your details and afterwards your density. It is always best to first lay foundation, and then erect the structure. Any builder will tell you that.

One of the most valuable elements of a developer is water, and it is too little used, or in other words, too little of it is used. Particularly for all plates of suspected under-exposure or of doubtful time, as well as for all large heads, a weak developer is required to start, and if found to want more strength, it is easily changed by addition of pyro.

Looking to pyro for density and the accelerator for details, it is easy to understand by varying the proportions of these two elements most, any desired effect can be secured. The strong developer gives dense, harsh results, while a weak developer gives soft and delicate effects, hence the value of more water. Remember the mild power is most effective for perfect results in developing. Don't give heroic treatment at the start in any case.

It often happens at the close of a day's work, with a big crop of negatives to develop, that the operator, anxious for supper, pushes the work too rapidly for safety. The next morning they are found coarse, harsh, and smudgy. They were killed from overdose. If the proprietor have a care of the good name of his work, the sitters must be recalled and taken. Too much haste often spoils what a little patience would have saved.

What I believe to be the best and safest method is to commence with the developer weak and with the accelerator in excess of the pyro. As the development progresses and a want of more strength or density is discovered, pyro should be added to it. To wear the same weight of clothing throughout the year, in cold and hot weather alike in a climate like ours, would be reckless and inhuman, but no more absurd than to give all plates the same strength of developer. No man can give a formula for all plates and all conditions, but by care and observation all men who develop plates may learn to adapt proportion and strength of solution to the plate requirement.

Now a word about making the image in the albumen paper. All printers know that silver makes the print—too many of them think the more silver used the better the print. As a rule, when anything is found to be wrong, more silver is doused as a remedy. Where forty of grains of silver to the ounce of water is recommended by the albumenizer of the paper, who knows the proportion of salt used, and bases the requirements of silver upon that knowledge, the usual printer requires sixty grains. Just enough chemicals for plate or paper is better than too much. The tendency to overdose is prevalent, and the results are similar upon plate and paper alike. In both cases the overdose gives harsh effects, forms a crust upon the surface, preventing the gradual and perfect conversion through the film, clogs the shadows, and flattens the lights. It is not unusual to see prints with the shadows and dark parts hardly loaded with a bronzed Mars, and sometimes even a green fog from overdose. Gold is always subject to the same abuse, being sometimes used so strong as to destroy rather than produce good tones.

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* Presented at the Chicago Convention.

A little more knowledge among operators and printers of paper, and necessary conditions for successful work in their departments of photography, and a careful observance of the requirements, would greatly lessen the mortality list in plates and paper.

ON THE TREATMENT OF VERY SENSITIVE PLATES.

BY G. CRAMER.*

Dry-plates were originally made to take the place of wet-plates, with hardly a thought of making them more rapid than collodion, and the keeping quality was at that time the main desideratum.

That the dry-plate contained within itself the possibilities of great speed was evolved at a later day, and as the working of dry-plates became more familiar to the craft, a demand for more speed or sensitiveness was made, and as promptly met by emulsion makers, and plates are made of sufficient sensitiveness to reproduce objects moving at a high rate of speed, and really wonderful achievements in this direction are to be seen every day.

That plates of a high degree of sensitiveness require very careful treatment is at once apparent when we consider how readily they respond to the faintest touch of light, be it light entering through the lens or through a pinhole in the bellows of the camera (which may be invisible from the outside), the minutest ray of light entering through door of slide, or between tablet and back of camera—prolific sources of trouble. All of these will be promptly registered upon the plate, causing fog, for which the plate will often be blamed, and condemned as foggy and worthless.

Although very sensitive plates are as easy to manipulate as plates of lower sensitiveness, they require more care and attention to have the proper safeguards thrown around them—safeguards which really should be used for all dry plates.

It is not fair to subject plates of different degrees of sensitiveness to the same conditions and treatment to determine upon their merits. For reasons already stated, a slower plate may remain perfectly clear when a more sensitive plate will show signs of fog in the same proportion as when an old style wet plate would be compared with a modern dry-plate. It is a pity that so often the finest plates are spoiled by improper treatment.

If photographers would be as careful in their manipulations as the maker of the plate has to be, there would be little complaint, and it would not happen that one will say, "Number so-and-so is no good." Another will write, mentioning same number, "Send me every plate you have of it." Another one writes, "I want a very rapid plate, but one that is not so sensitive." This is an absurdity; rapidity and sensitiveness are one and the same, and cannot be separated.

To work very sensitive plates successfully, everything should be in the best working order. The dark-room, aside from being roomy, well-ventilated, and having all the necessary conveniences, should be perfectly tight, and the colour of it, inside, non-actinic. Coloured paper used for the lantern or window will fade, and should be removed from time to time.

Examine dark-room, camera, tablets, and lens at intervals; see that your dishes are always clean, and everything convenient.

Have your chemicals fresh and pure and well stoppered.

Bear in mind the difference between chemicals of the same kind but in different form. For instance, sulphite of soda granular is about twice as strong as sulphite of soda crystals. Carbonate of potassium is about equal in strength to dried carbonate of soda; both are about twice as strong as the carbonate of soda crystals, or sal soda, as it is commonly called.

Guard against any trace of diffused light, too much exposure to the coloured light while developing, or having the coloured light too strong.

Use fresh developer for short exposures, and old developer for over-timed plates, remembering that old developer will produce more contrast and clearness on addition of a little old developer or a little bromide developer in proportions to suit the exposure. If very much over-timed, restrain by adding solution of bromide of potassium, and if under-timed dilute the developer, and do not try to force the development by adding an extra dose of alkaline solution, as this will only injure the plate.

Observe that a developer strong in pyro produces strong negatives, and that the temperature of the developer and the quantity of alkali it contains is of great importance. If the developer is warm or contains too much alkaline, it will fog a very sensitive plate. Keep the developer cool in summer (about 70° deg. Fahr.); in summer the strength of alkali should be reduced to one-half the strength used in winter.

If uncertain about correctness of exposure, start with developer diluted with plenty of water, so that you may see what the plate wants before it is too late. If you commence with a strong developer the image will flash up at once, and the negative may be spoiled before anything can be done to save it.

If you commence with diluted developer you have a chance to change or modify the developer as the plate requires it.

There are many points in developing to which a careful operator will give due attention, and the results will demonstrate that it is worth all the labour and study to thoroughly master the science of develpment.

Review.

The Photographer's Indispensable Hand-Book. Compiled by Walter D. Welford, and Edited by Henry Sturmey. Large octavo, 379 pages. Price two shillings and sixpence. (*London*, 1887: *Iliffe and Son*, 98, *Fleet Street*).

The work before us comes as a new departure in photographic literature, and it is likely to be very useful to a large section of the photographic fraternity. Nearly a hundred pages are devoted to sketches, descriptions, and prices of the various cameras in the market, after which lenses, shutters, various apparatus, and materials, are dealt with in the same sort of way. In short, it forms a comprehensive guide to the purchaser of photographic goods.

THE SUN'S HEAT.

BY SIR WILLIAM THOMSON, LL.D. F.R.S. M.R.I.*

Professor of Natural Philosophy in the University of Glasgow.

Now it is a well-known property of gases and of fluids generally (except some special cases, as that of water within a few degrees of its freezing temperature, in which the fluid under constant pressure contracts with rise of temperature) that condensation and rarefactions, effected by augmentations and diminutions of pressure from without, produce elevations and lowerings of temperature in circumstances in which the gas is prevented from either taking heat from or giving heat to any material external to it. Thus a quantity of air or other gas taken at ordinary temperature (say 15° C. or 59° F.) and expanded to double its bulk becomes 71° C. cooler; and if the expansion is continued to thirty-two times its original bulk it becomes cooled 148° farther, or down to about 200° C. below the temperature of freezing water, or to within 73° of absolute cold. Such changes as these actually take place in masses of air rising in the atmosphere to heights of eight or nine kilometers or of twenty or twenty-five kilometers. Corresponding differences of temperature there certainly are throughout the fluid mass of the sun, but of very different magnitudes because of the twenty-seven fold greater gravity at the sun's surface, the vastness of the space through which there is free circulation of fluid, and last, though not least, the enormously higher temperature of the solar fluid than of the terrestrial atmosphere at points of equal density in the two. This view of the solar constitution has been treated mathematically with great power by Mr. J. Homer Lane, of Washington, U. S., in a very important paper read before the National Academy of Sciences of the United States in April 1869, and published with further developments in the *American Journal of Science* for July 1870. Mr. Lane, by strict mathematical treatment, finds the law of distribution of density and temperature all through a globe of homogeneous gas left to itself in space, and losing heat by radiation outwards so slowly that the heat-carrying currents produce but little disturbance from the globular form.

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* Presented at the Chicago Convention.

* Continued from page 571.

One very remarkable and important result which he finds is, that the density at the centre is about twenty[*] times the mean density; and this, whether the mass be large or small, and whether of oxygen, nitrogen, or hydrogen, or other substance; provided only it be of one kind of gas throughout, and that the density in the central parts is not too great to allow the condensation to take place, according to the ordinary gaseous law of density, in simple proportion to pressure for the same temperatures. We know this law to hold with somewhat close accuracy for common air, and for each of its two chief constituents, oxygen and nitrogen, separately, and for hydrogen, to densities of about two hundred times their densities at our ordinary atmospheric pressure. But when the compressing force is sufficiently increased, they all show greater resistance to condensation than according to the law of simple proportion, and it seems most probable that there is for every gas a limit beyond which the density cannot be increased by any pressure however great. Lane remarks that the density at the centre of the sun would be "nearly one-third greater than that of the metal platinum," if the gaseous law held up to so great a degree of condensation for the ingredients of the sun's mass; but he does not suggest this supposition as probable, and he no doubt agrees with the general opinion that in all probability the ingredients of the sun's mass, at the actual temperatures corresponding to their positions in his interior, obey the simple gaseous law through but a comparatively small space inwards from the surface; and that in the central regions they are much less condensed than according to that law. According to the simple gaseous law, the sun's central density would be thirty-one times that of water; we may assume that it is in all probability much less than this, though considerably greater than the mean density, 1·4. This is a wide range of uncertainty, but it would be unwise at present to narrow it, ignorant as we are of the main ingredients of the sun's whole mass, and the laws of pressure, density, and temperature, even for known kinds of matter at very great pressures and very high temperatures.

The question, Is the sun becoming colder or hotter? is an exceedingly complicated one, and in fact, either to put it or to answer it is a paradox, unless we define exactly where the temperature is to be reckoned. If we ask, How does the temperature of equi-dense portions of the sun vary from age to age? the answer certainly is that the matter of the sun of which the density has any stated value, for example, the ordinary density of our atmosphere, becomes always less and less hot, whatever be its place in the fluid, and whatever be the law of compression of the fluid, whether the simple gaseous law or anything from that to absolute incompressibility. But the distance inwards from the surface at which a constant density is to be found diminishes with shrinkage, and thus it may be that at constant depths inwards from the bounding surface the temperature is becoming higher and higher. This would certainly be the case if the gaseous law of condensation held throughout, but even then the effective radiational temperature, in virtue of which the sun sheds his heat outwards, might be becoming lower, because the temperatures of equi-dense portions are clearly becoming lower under all circumstances.

Leaving now these complicated and difficult questions to the scientific investigators who are devoting themselves to advancing the science of solar physics, consider the easily understood question, What is the temperature of the centre of the sun at any time, and does it rise or fall as time advances? If we go back a few million years to a time when we may believe the sun to have been wholly gaseous to the centre, then certainly the central temperature must have been augmenting; again, if, as is possible though not probable at the present time, but may probably be the case at some future time, there be a solid nucleus, then certainly the central temperature would be augmenting, because the conduction of heat outwards through the solid would be too slow to compensate the augmentation of pressure due to augmentation of gravity in the shrinking fluid around the solid. But at a certain time in the history of a wholly fluid globe, primitively rare enough throughout to be gaseous, shrinking under the influence of its own gravitation and its radiation of heat outwards into cold surrounding space, when the central parts have become so much condensed as to resist further condensation greatly more than according to the gaseous law of simple proportions, it seems to me certain that the early process of becoming warmer, which has been demonstrated by Lane, and Newcomb, and Ball, must cease, and that the central temperature must begin to diminish on account of the cooling by radiation from the surface, and the mixing of the cooled fluid throughout the interior.

Now we come to the most interesting part of our subject—the early history of the Sun. Five or ten million years ago he may have been about double his present diameter and an eighth of his present mean density, or ·175 of the density of water; but we cannot, with any probability of argument or speculation, go on continuously much beyond that. We cannot, however, help asking the question, What was the condition of the sun's matter before it came together and became hot? It may have been two cool solid masses, which collided with the velocity due to their mutual gravitation; or, but with enormously less of probability, it may have been two masses colliding with velocities considerably greater than the velocities due to mutual gravitation. This last supposition implies that, calling the two bodies A and B for brevity, the motion of the centre of inertia of B relatively to A must, when the distance between them was great, have been directed with great exactness to pass through the centre of inertia of A; such great exactness that the rotational momentum, or "moment of momentum,"[*] after collision was no more than to let the sun have his present slow rotation when shrunk to his present dimensions. This exceedingly exact aiming of the one body at the other, so to speak, is, on dry theory of probability, exceedingly improbable. On the other hand, there is certainty that the two bodies A and B at rest in space if left to themselves undisturbed by other bodies and only influenced by their mutual gravitation, shall collide with direct impact, and therefore with no notion of their centre of inertia, and no rotational momentum of the compound body after the collision. Thus we see that the dry probability of collision between two neighbours of a vast number of mutually attracting bodies widely scattered through space is much greater if the bodies be all given a rest, than if they be given moving in any random directions and with any velocities considerable in comparison with the velocities which they would acquire in falling from rest into collision. In this connection it is most interesting to know from stellar astronomy, aided so splendidly as it has recently been by the spectroscope, that the relative motions of the visible stars and our sun are generally very small in comparison with the velocity (612 kilometers per second) which a body would acquire in falling into the sun, and are comparable with the moderate little velocity (29·5 kilometers per second) of the earth in her orbit round the sun. To fix the ideas, think of two cool solid globes, each of the same mean density as the earth, and of half the sun's diameter; given at rest, or nearly at rest, at a distance asunder equal to twice the earth's distance from the sun. They will fall together and collide in exactly half a year. The collision will last for about half an hour, in the course of which they will be transformed into a violently agitated incandescent fluid mass flying outward from the line of motion before the collision, and swelling to a bulk several times greater than the sum of the original bulks of the two globes. How far the fluid mass will fly out all round from the line of collision it is impossible to say. The motion is too complicated to be fully investigated by any known mathematical method; but with sufficient patience a mathematician might be able to calculate it with some fair approximation to the truth. The distance reached by the extreme circular fringe of the fluid mass would probably be much less than the distance fallen by each globe before the collision, because the translational motion of the molecules constituting the heat into which the whole energy of the original fall of the globes become transformed in the first collision, is probably about three-fifths of the whole amount of that energy. The time of flying out would probably be less than half a year, when the fluid mass must begin to fall in again towards the axis. In something less than a year after the first collision the fluid will again be in a state of maximum crowding round the centre, and this time probably even more violently agitated than it was immediately after the first collision; and it will again fly outward, but this time axially towards the places whence the two globes fell. It will again fall inwards, and after a rapidly subsiding series of quicker and quicker oscillations it will subside, probably in the course of two or three years, into a globular star of about the same dimensions, heat, and brightness as our present sun, but differing from him in this, that it will have no rotation.

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[*] Working out Lane's problem independently, I find 22½ as very nearly the exact number.

[*] This is a technical expression in dynamics which means the importance of motion relatively to revolution or rotation round an axis. Momentum is an expression given about a hundred and fifty years ago (when mathematicians and other learned men spoke and wrote Latin), to signify translational importance of motion. Moment of a couple, moment of a magnet, moment of inertia, moment of force round an axis, moment of momentum round an axis, and corresponding verbal combinations in French and German, are expressions which have been introduced within the last sixty years (by scientists speaking as now, each his own vernacular) to signify the importance of the special subject referred to in each case. The expression moment of momentum is highly valuable and convenient in dynamical science, and it constitutes a curious philological monument of scientific history.

(*To be continued.*)

Patent Intelligence.

Application for Letters Patent.

12,191. Arthur Samuel Newman, 34, Southampton Buildings, London, W.C., for "Improvements in shutters for photographic cameras, and in the mechanism for actuating such shutters."—September 8, 1887.

12,275. William Tylar, 31, Yates Street, Aston Road, Birmingham, for "A folding developing tray with plate lifting frames in which all handling of photographic plates is entirely avoided."—September 10, 1887.

12,285. Frank Miall, 13, Shelgate Road, Northcote Road, Battersea Rise, Surrey, for "An improvement in tripod heads for photographic cameras."—September 10, 1887.

12,292. Arthur Marriott, 323, High Holborn, Middlesex, for "Improvements in washing photographic prints and in apparatus therefor."—September 10, 1887.

Official Abstract of Accepted Complete Specification.

13,549 of 1886. Brookes. "Cameras (including lens and lens fittings)."—Focussing-hood; hinged shutter to dark slide open inwards; combined slow and rapid shutter; lens inside box body.

14,401 of 1886. Browne (*Cellerier*). "Printing, colouring, and finishing."—Colouring: coloured silhouette produced from second print and applied to transparent print.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

2677 of 1883. A. M. Clark (*Lindop*).—"Photographers' backgrounds, &c."

Patents Granted in America.

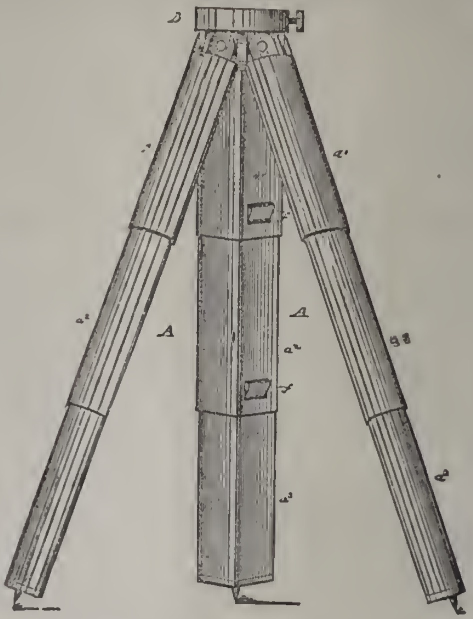
368,426. Ferdinand S. Ruttman, Plainfield, N.J., and George Singer, Pittsburg, Pa., for "Tripod."—Filed Nov. 13, 1886. Serial No. 218,758. (No model.)

Claim.—1. A tripod the legs of which are composed of tubular telescoping sections of sector-shaped cross-section, substantially as set forth.

2. A tripod the legs of which are made of tubular telescoping sections of sector-shaped cross-section, and devices for locking the said sections to each other when extended, substantially as set forth.

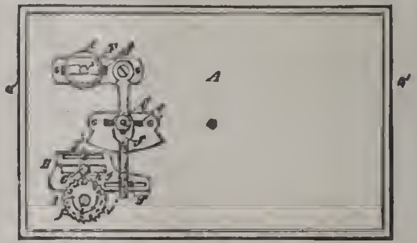
3. A tripod the legs of which are made of tubular telescoping sections, the upper and intermediate sections being provided with slots and inwardly-bent flanges, while the upper ends of the intermediate and lower sections are provided with slotted collars and locking-springs, substantially as set forth.

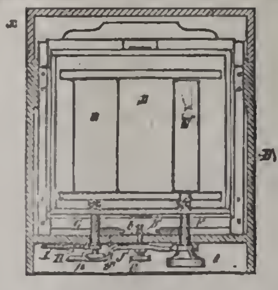
4. The combination of a tubular leg-section having a slot and inwardly-bent flange at the lower ends, said flange having an inclined lip at one point thereof, a second tubular leg-section having a slotted collar at its upper end, and a locking-spring located in the slot of said collar and adapted to project through the slot of the first section, so as to interlock therewith or be released therefrom by the action of the inclined lip, substantially as set forth.



368,732. Henry C. Price, New York, Assignor to the Scovill Manufacturing Company, same place, "Photographic camera." Filed July 29, 1886. Serial No. 209,413. (No model.)

Claim.—The combination, with a camera, of a box or case for containing the same, rollers for sensitized paper, journals upon said rollers extending to the outside of said box or case, a movable plate through which one of said journals extends, a hand-piece on the other of said journals for causing the rotation of both said rollers, a projection on the journal of the roller first named, and a toothed indicator arranged in the path of and adapted to be directly engaged with said projection and rotated a distance equal to the distance between two of its teeth at each rotation of the said rollers, substantially as specified.





Specifications Published.

4202. George Frederick Blackmore, Civil Engineer, 1, Coulter Road, The Grove, Hammersmith, W., for "Improvements in washing and draining racks for photographic negatives."—Dated March 21st, 1887.

The claim is for—

1. A portable rack made with two or more corrugated or grooved sides connected together so that they can be folded, collapsed, or closed up with a parallel or nearly parallel movement of the parts, substantially as described.

2. The connection of the corrugated or grooved sides of such racks by two or more wires or bands fastened to them by means of staples or clips so as to form hinges, substantially as described.

3. The attachment of loops or handles, to the wires or bands, or strips, or other convenient parts of such racks, so that they can be folded up close to the sides of the rack, substantially as described.

4. The attachment of ledges or stops to the corrugated or grooved sides of such racks for the negatives to rest on, substantially as described.

5. The connection of the corrugated or grooved sides of such racks by two or more flat or other shaped strips by means of pins, bolts, or rivets, substantially as described.

6. The arrangement for allowing the wires, bands, or connecting strips to be wholly or partly detachable from the sides of such racks, substantially as described.

7. The arrangement for providing the wires, bands, or connecting strips with one or more knuckle joints or hinges in them, substantially as described.

Correspondence.

THE PHOTOGRAPHIC EXHIBITION.

Sir,—Kindly permit me to remind intending exhibitors that Wednesday next, September 21st, is the last day for receiving "Packing Cases" from the country by our Agent, Mr. Bourlet, 17, Nassau Street, Middlesex Hospital; and also that the same day is the only one for receiving pictures and apparatus at the Gallery.

Any further information may be obtained from me.—Yours truly, Edwin Cocking,

5a, *Pall Mall East, S.W.* Assistant Secretary.

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 8th inst., W. H. Prestwich in the chair.

A photograph of lightning was shown on behalf of J. Robinson, London.

E. Plomer drew attention to a print with a dark band across, said to represent a rainbow. As the negative was taken from a steamer off the coast of Australia it was surmised that the mark was due to an obstacle of a solid character.

A question: How to remove yellowness in negatives reduced by the "Farmer" method, was answered by a recommendation to use the hydrochloric acid and alum clearing solution.

Another querist wished to substitute a lighter metal than brass for lens mounts. Aluminium was suggested.

A. Cowan had recently exposed several plates equally, using varying proportions of soluble bromide in development, viz., from a quarter of a grain to sixteen grains, and in the negative developed with the latter quantity there was more detail than in the others, showing that the presence of bromide is not a restrainer, but merely a retarder of development.

A large group photograph of members of the Edinburgh Photographic Society and visitors taken by Crook was handed round for inspection. The chief peculiarity consisted in the figures being posed out of the centre of the field of view, instead of the customary plan of concentrating the whole interest upon a mass of faces.

North London Photographic Society.

At the meeting held at Myddelton Hall, Islington, N., on Tuesday, September 6, J. Traill Taylor in the chair, Arthur E. Smith was elected a member.

A question was asked whether there was any advantage or disadvantage in constructing a doublet lens with the combinations of widely dissimilar focus.

The President said that rectilinear lenses were now frequently constructed with the back combination of shorter focus than the front, this system being found to conduce to flatness of field.

J. Jackson had been in the habit of interchanging the combinations of his portable symmetricals, and found that he could obtain lenses of intermediate focus which worked thoroughly well.

The Hon. Secretary, in using his Darlot's combination set, preferred to use a long focus front combination with a short focus back combination.

In opening the discussion on "Lantern Matters," A. Mackie said that when using a condenser, either for enlarging or for projecting a picture on the screen, it had been recognised as a principle that the source of light should be as nearly a point as possible. The oxyhydrogen light practically fulfilled this condition. When this was unattainable he thought that the arrangement suggested by Mr. Traill Taylor at the Conference of the Camera Club was worthy of consideration. This consisted in an adaptation of the albo-carbon gaslight fitted to the lantern, two burners being employed, one being about an inch behind the other, with an air space between. Interposed between the condenser and the flame, as close to the latter as possible, was a diaphragm having a circular opening half an inch to one inch in diameter, the position of the diaphragm being such as to hide all the light except a portion of the most luminous part of the flame. The ordinary oil lamp had the disadvantage of unevenly illuminating the screen, owing to the division of the wicks. He thought, however, that Mr. Taylor's principle might also be applied to oil lamps.

J. H. Bird preferred the oxyhydrogen to the oxycalcium light.

The President said that with a little management a good illumination could be obtained by the oxycalcium light. The wick of the spirit lamp should be comparatively long, and should be split into two parts, between which the oxygen should be directed on to the lime. The President then described Professor Fairchild's method of preparing oxygen while the lantern exhibition or demonstration was in progress.

E. Clifton described the Brins Oxygen Company's light, which differed from the ordinary oxyhydrogen light in the use of a small ball of a comparatively indestructible substance in the place of the lime. This light, though admirable for house illumination, had the disadvantage for use in the lantern that the most intense part of the flame was at the bottom.

In a discussion upon lantern slides, the importance of adopting an uniform method of marking was pointed out, and it was explained that the standard system of the Photographic Club, which was now almost universally used, was that a white spot be placed on each of the top corners when the slide was viewed, so that the subject appeared as in nature, or a white line along the top edge.

Mr. Clifton spoke of the inconvenience caused by the use of glasses not uniform in size. He advocated that all slides be made on $3\frac{1}{4}$ by $3\frac{1}{4}$ plates.

C. Higgins showed some slides on gelatino-citro-chloride plates of his own manufacture printed out and toned with gold.

T. Utton showed a dark slide with bag attachment for changing plates in the field.

Next meeting will take place on Tuesday, September 20. Visitors are invited.

Sheffield Photographic Society.

The ordinary monthly meeting was held on the 6th inst., A. S Platts in the chair.

After the appointment of Messrs. Charlesworth and Spencer as auditors, arrangements were made for the annual meeting on October 4th. It was resolved that a dinner should preface the proceedings.

The Hon. Sec. was instructed to send out circulars to the members, inviting them to send in nominations for the various officials and council, and to obtain printed voting papers for the night of election, which will be by ballot.

J. W. Charlesworth then read a paper on "Notes on Development."

Birkenhead Photographic Association.

The ordinary meeting was held in the Free Public Library on the 8th instant, J. A. Forrest in the chair.

A. H. Martin, E. R. Weare, Joseph Joplin, and Julio Gonzobz, were elected as members.

Prints were exhibited by Messrs. Forrest, Riley, Eaton, Stansfield, and Lange; the latter had some very large ones by Messrs. W. Cobb and Sons, Woolwich, taken on Jubilee Day in the vicinity of Westminster Abbey, of the royal procession *en route*, which compared favourably with those taken at the same time by other operators.

H. H. Williams showed an interesting instantaneous one illustrating the effect of firing a shot into water from an ordinary sporting breechloader; the amount of water raised as depicted was surprisingly great, whilst the spray therefrom had reached a height of some twelve to fifteen feet, and the gun in the hands of the firer, instead of aiming at the point of impact, as would be supposed it should, had "jumped" so considerably as to be represented in an almost horizontal position.

The President read a paper entitled "How to Manipulate the Camera in a Military Manner" (see page 586), the novelty of a camera mounted on a gunstock in lieu of the orthodox tripod exciting a good deal of interest. It was thought by some to be an unnecessary addition to the *impedimenta* of a photographer, and that similar results could be obtained, when snap shots were required, by simply holding the camera in the hand and pointing it at the object to be taken, the finder showing when it was properly balanced on the plate.

Mr. Forrest, however, thought otherwise, and substantiated his case by showing some excellent prints taken as described in his paper.

A member stated that he dispensed with the use of a finder altogether, as he found in practice that by glancing along the top edges of his camera he could locate a view with the greatest accuracy.

H. Wilkinson took exception to the President's statement that after thirty yards a lens has no focus, as he had not found it so himself.

Some discussion took place on the subject, with the result that it was thought that the fact could not be looked upon as established, lenses varying much in this respect, especially when of the larger sizes.

The utility of detective cameras was illustrated by an account of a photographer who had recently visited the fleet with one whilst lying in the Mersey, and came away with a large number of views taken on the various vessels.

Talk in the Studio.

Charterhouse Literary Institute.—The Science and Art Schools.—The winter session of this Institute will commence on Saturday, October 1st, 1887, under the Presidency of the Rev. Henry Swann, M.A. During the late session about 950 students availed themselves of the privileges afforded by this institution, and of this number more than half presented themselves for examination, and were successful in obtaining the certificate of the Science and Art Department of South Kensington. Of eight students prepared for the Lond. B.Sc. examination, only one student failed, the others highly distinguishing themselves. Instruction of a practical character is given in most of the sciences at a very nominal fee, whilst in art, at an equally low rate, students under the direction of five competent instructors can be advanced in their studies. Those who have leisure can at a very moderate charge attend the day classes in art; day classes will also be held to prepare candidates for matriculation (Lond.), the clerical, medical (including dental), legal, and other examinations. Students who aim at becoming proficient in chemistry (organic and inorganic) have the opportunity of working in a well fitted laboratory, capable of accommodating sixty students. Aspirants for university honours can at a small expense be assisted. Classes for matriculation, Latin, Greek, French, German, music, and shorthand are taught by well qualified teachers. Opportunities for the study of photography and watchmaking will be continued this session. Full particulars of the classes may be obtained from C. Smith, organising Secretary, care of the Vicar, St. Thomas, Charterhouse, London, E.C.

Photographic Society of Great Britain.—The usual monthly Technical Meeting of this Society will be held on Tuesday next, September 20th, at 8 p.m., at the Gallery, 5a, Pall Mall East. Open at 7 p.m. for journals and conversation.

Photographic Club.—The subject for discussion on Sept. 21 will be "Lenses." Saturday outing at Rainham; trains, Fenchurch Street, 2.32.

To Correspondents.

Cairo.—When rain water is used, there is generally more tendency towards frilling than when hard water is employed. The addition of a little Epsom salts to soft water will make it correspond to spring water as far as this use is concerned. Half an ounce in each large pail of water will be sufficient.

Ed. V. Boissonas.—The matter will rest with the receiving committee, who will have to consider how far such an exhibit would interest the public.

H. M. O.—We can hardly judge as to your chances without knowing something about your qualifications; but it would, at any rate, be well for you to answer advertisements, and perhaps to advertize yourself.

T. G. B.—Probably a pyrotechnic light like that referred to by T. Frewing on p. 166 of the Year-Book for 1885.

J. H. Lundager.—1. We shall be glad to receive the views you refer to, and are much interested in your remarks. 2. Prints from most of them can be obtained, but they are not very good, the negatives having become damaged. 3. Should you do so, we shall endeavour to assist you to the best of our ability.

J. E. T.—The spots are pretty evidently due to some foreign matter settling on the surface of the paper when drying—either after the albumenizing or after the sensitizing. If the former, the remedy is to obtain paper from another source; but if the latter, you must sensitize and dry under such conditions as shall preclude the presence of chemically-active dust.

Acid.—1. The wheel trimmer—if you have got the right instrument—will run easily round ovals, provided that, as a templet, you use a plate of thinnish zinc—say one thirty-second of an inch—in which an aperture of the right size has been cut. You can either cut upon glass or on a plate of stout zinc. The cutter seldom requires sharpening, and the best way is to mount the wheel in the lathe and use a slip of oilstone; but, by the exercise of care and patience, it can be sharpened without the lathe. 2. It results from unequal texture of the paper, and will probably show less if you make the solution rather weaker.

Caretaker.—A description of an arrangement of the kind will be found in the current Year-Book; but it does not therefore follow that there are no new features in your invention. If you will send us a detailed description, we will publish it if suitable.

Artist.—1. Let us see a print. 2. A mere trace of such a lubricant, such as wax or Castile soap, will not cause the inconvenience you refer to. A convenient way of using the former is to dissolve twenty grains in one ounce of benzol, and to rub this on with a tuft of flannel.

P. Bardfield.—1. It is certainly not a usual method in such cases, and we very much doubt its expediency. Try that which the person referred to condemns so strongly. 2. It is so purely a matter of personal arrangement, that we hesitate to express an opinion; but in the former case the price should be very much lower than the latter.

A Beginner.—As a rule such additions considerably reduce the virtual activity of the solutions, and possibly because they temporarily harden the gelatine.

Chas. T.—1. It may arise from the cause stated, but we think it unlikely, as in such a case the surface of the albumen would be roughened. 2. Commercial sulphuric acid will serve the purpose just as well as the purified article, which is sold at five or six times the price. 3. Silver wire should be used.

The Photographic News.

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For Advertisement Scale see page v.

Advertisements should be forwarded (prepaid) to Piper and Carter, 5, Furnival Street, Holborn, E.C., to reach the office not later than noon on Thursday. A fee of 6d. must be forwarded when the Publishers are expected to receive and forward replies to Advertisements; and when they undertake the receipt of replies, they must be entrusted with the name and address of advertiser, for revelation to applicants, in case they may deem it necessary.

PATENT OFFICE LIBRARY

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1516.—*September* 23, 1887.

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LOOK TO YOUR MOUNTING BOARDS !

How often has this cry been circulating among the photographic fraternity ? And with so little result in the way of banishing injurious mounts from the market, that there was, perhaps, never a time when the proportion of silver prints indirectly hurried on in the path towards decay was greater than now.

Hyposulphite of soda is not, as was at one time supposed, the only mount poison of which the photographer has to beware—nor, indeed, is it at present the principal source of mischief ; but, as far as our observations go, the main mischief of the present-day mounts arises from the presence of certain iron compounds in the mounts.

The fading, which may result from iron salts in the mounts, has been referred to from time to time in the Photographic News, and was indeed dealt with at considerable length eighteen years ago by George Dawson, who, at that time, was lecturer on photography at King's College.

The higher chloride of iron (Fe_2Cl_6) rapidly attacks the silver of an ordinory photographic mount, converting it—if the action is complete—into the normal chloride of silver ($AgCl$) ; the iron perchloride becoming reduced at the same time into the lower chloride, $FeCl_2$. It is not, however, necessary that, for the injurious effects of perchloride of iron to manifest themselves, the perchloride of iron should have originally existed as such in the mounts, as this injurious salt—or, indeed, the free sulphate, which is nearly as mischievous—may be formed by the slow action of soluble salts on insoluble oxide of iron contained in the paper material ; this being more especially the case when the card is kept long in a damp place.

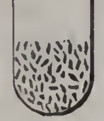
Iron, in one form or another, is present in every sample of dark-coloured or buff card which we have examined, and it is with respect to the darker coloured cards that we have received the bulk of many recent complaints. In the case of some of these mounts, the iron is so loosely held, that water alone will extract enough to strike a blue colour with ferrocyanide of potassium ; but in other instances the iron is not extractable by water alone, but readily comes into solution if a portion of the mount is treated with water containing a little hydrochloric acid.

The body of the buff-coloured mount is generally made, for the sake of cheapness, of a pulp containing iron, this metal usually being in an insoluble state in the case of the individual sheets of which the card is to be built up ; but in the process of cementing together these sheets, the elements necessary to produce soluble iron compounds are introduced, as the paste or cement used almost invariably contains an appreciable proportion of common salt (chloride of sodium), and, if not acid when used, generally becomes so before the sheets of cardboard are dry. In such a case, the soluble and highly mischievous perchloride of iron is formed, and either makes the prints fade all over, or works through holes in the enamel coating, and produces the spotted appearance so well known to many of our professional readers.

In other instances, the enamel itself contains the materials required to convert the harmless insoluble peroxide of iron more or less completely into the soluble perchloride ; while, in a few instances, the use of an acid mounting material may have made things worse, although, in this connection, we may observe that it is difficult to suppose any professional photographer, or even skilled amateur, so utterly behind the times as to use an acid mountant for silver prints. Still, some may under-estimate the rapidity with which starch paste and gum become sour.

The photographer should, then, look well to his mounting boards, and if he values his reputation, he should both test for hyposulphites and for sulphides ; also do his best to ensure the absence of all iron compounds, or, at any rate, he should perform such tests as we indicate below.

Testing for Sulphides.—This is a matter of considerable importance, as commercial paper is very liable to contain sulphides, especially after having been stored in a damp place ; and the presence of these sulphides may come about from the reducing action of the damp organic matter on the sulphate of lime, so often used as a loading, or by the reducing action of damp organic matter on hyposulphite of soda. Moreover, injurious sulphides may be introduced by the manufacturer in the shape of ultramarine. To test for sulphides take a glass tube, closed at one end, and slightly expanded at the neck—in short, a test-tube about five inches long ; cut up some of the card or paper, add enough water to nearly cover it, and a piece of citric acid as large as a small pea. Now take a disc of paper that will cover the top of the tube, and hang from this, by means of a thread, a slip of white blotting-paper which has been moistened with a solution of acetate of lead ; one part in five or six of water. The whole apparatus is shown by the cut. If there is a very large proportion of any sulphide present, the lead paper will very soon blacken ; but if the proportion is small, the action is less rapid. It is just as well to very slightly warm the mixture by holding the tube over a gas or candle flame, but the heat should not nearly reach the boiling temperature ; now set the apparatus aside (in an upright position), and examine it next day. If there is no darkening whatever of the lead paper, one may conclude the card to be free from sulphides.



To Test for Hyposulphite.—Cut up the mount in small pieces, and soak them for some hours in sufficient water to cover them, after which filter off the liquor. Next prepare some iodide of starch solution in the following manner. Pour a teacupful of boiling water on about five grains of starch, so as to dissolve the former, and when the solution is quite cold, mix some of this with a saturated solution of iodine in water, and endeavour to add just the proportions that will give the most intensely blue solution.

Now, put that water in which the pieces of card mount were infused into a white earthen vessel, as a teacup, and into a similar teacup put an equal bulk of ordinary water. To the plain water is now added the iodide of starch solution, drop by drop, until a faint blue tint is visible in the water, after which the same quantity of iodide of starch solution is added to the water in which the cardboard was infused. Hyposulphite destroys the blue colour of the iodide of starch, and if this injurious salt is present, an amount of iodide of starch which will permanently blue the plain water will not make the liquid filtered off from the mounts blue, and by noting how much iodide of starch is decolourised by the infusion of each one of a series of samples of card an approximate estimate of the relative impurity of each may be made.

Testing for Iron.—A mount may be tested for iron in the soluble state by first making an infusion in water as directed when describing the test for hyposulphite, and adding to this a few drops of an aqueous solution of ferrocyanide of potassium. The production of a blue colour indicates iron. A soluble iron compound may be considered in all cases as injurious. To test for iron in an insoluble state, but in such a condition as to readily become soluble, pour fresh water on the pieces of mount left from he previously described test, and for each drachm of water add two drops of pure hydrochloric acid, allow the whole to soak for an hour or two, and then filter off and test with ferrocyanide of potassium as before. Iron in the condition indicated by this test may become soluble and mischievous if the photographs are allowed to remain in a damp place, as then the paste used in making the card will probably become acid.

The Practical Test with a Trial Print.—This is, perhaps, the most important of all tests, as if done with reasonable care, a result obtained by it will convince a person who is instinctively suspicious of results obtained by complex chemical tests, and, moreover, when a photographer obtains by this test a decisive verdict as to the badness of a mount, he can generally make the vendor of them not only remit the original charge, but also pay some reasonable compensation for any loss of reputation resulting from the fading of photographs sent out on the bad mounts. Moreover, the practical test as about to be described is one which is well calculated to convince a jury. The method is a simple one, and consists in simply cutting a print in two, and mounting one portion on a sample of card known by experience to be satisfactory, and the other portion on the questionable mount: both portions being then placed side by side in a damp place. A very bad card will begin to show signs of mischief in a few weeks, and in order to expedite matters the print used should be a rather thin one. It is well to remember that an experiment such as this carries conviction in proportion as it is strictly comparative, so the greatest care should be taken to ensure for the two portions of the print conditions which exactly correspond as regards everything but the mount used.

Schulz's Method of Expediting the Practical Test.—The weak point of the practical test as described above is the great length of time which may elapse before indications are obtained; but in the meantime it is well to make an additional test by Schulz's quick method, as an indication by this, though perhaps not so convincing to such an outsider as the average juryman, will generally convince one who is conversant with photographic work. It is conducted as the last described test, but the paste used for mounting is to be mixed with one-twentieth of its weight of glacial acetic acid, and under these circumstances any mischievous tendency of either mount may be considered to be equally exaggerated. Indeed, every intelligent photographer who is careful to avoid acid mountants knows very well that it is not the vegetable acid of the sour gum or starch which is to be feared, but the reaction of this acid upon a mount in itself bad.

In quoting some remarks made in 1869, by George Dawson in the *Illustrated Photographer*, we shall show that the evil effects of iron salts were recognised eighteen years ago. Mr. Dawson says:—

> Some six weeks ago, a gentleman largely connected with the photographic trade in London called on me with a parcel of mounted photographs, which had been returned because they faded very quickly. Some others, afterwards, were brought to me which had faded in the same way, although recently mounted. Along with these I was shown other *unmounted* photographs, printed at the same time, which preserved all their original brilliancy and vigour. I may also say, an immense number more had been returned, from the same fading fault, through various agents.
>
> Why and wherefore, was my applicant's query; and I may as well print it in nearly his own words. "The prints were made most carefully on the best albuminised paper. They were washed most thoroughly in abundance of water; why, therefore, should the mounted prints fade so quickly, while the unmounted ones retain their pristine vigour? I may as well inform you that I was bound, much against my wish, by the gentleman who took the negatives, to mount the proofs on these coloured cards."
>
> These prints were mounted on a *buff-coloured* and *mat-surface* cardboard. The appearance of disfiguration or fading was very peculiar, and not like that usually displayed by acids or hyposulphite of soda. There was little yellowing of the high lights, but a decided lowering of tone from the original photographic tint in the shadows, and some of the feebler details had disappeared altogether. Such were the appearances presented by the originally beautiful pictures which I was called on to examine. I may add to this description a fact which may be of some significance. The buff-yellow colour of the mounting board was due to a thin yellow paper pasted on to, apparently, ordinary cardboard.
>
> I boiled up, for four hours, in distilled water, about one hundred square inches of the mounted prints—mounts and all—after having cut them into small shreds. The whole was then pounded into a thin pulp in a mortar, and again put on a hot sand-bath for two hours more; by which time most or all the soluble extractive matter would be in solution. The decoction, when cold, was filtered, and the liquid concentrated down, by evaporation, to 6 fluid ounces, and tested first for acids. Freshly prepared litmus paper retained its blue colour in the solution at the end of half an hour. *Therefore acid in the mounts had nothing to do with the fading.*
>
> Next I tried for soluble hyposulphites, by the delicate iodide of starch test. There was not one-thousandth part of a grain present in the whole hundred square inches, so *that* destructive agent could have had little power for evil.
>
> I then removed the yellow paper from several mounts, and found the colour to consist of one of the chrome yellows, totally insoluble in hot or cold water. But now for the secret of the fading. Why there should have been mixed up with this colour a large quantity of chloride of iron, the manufacturer of the paper knows best. The chrome-yellow is in itself innocuous, but either of the chlorides of iron will, after a time, be utterly destructive to a silver print mounted on paper containing these substances.

* * *

SOME CONVENIENCES FOR THE PHOTOGRAPHIC LABORATORY.

Although it is possible to very successfully practise photography not only without a special apartment devoted to the work, but even without any exclusively photographic appliances beyond camera, lens, and dark lantern, the worker who studies to adopt the best and most convenient arrangements is generally well repaid for his trouble, and among recent photographic conveniences we may figure some which are described by Albert Londe in a recent issue of *La Nature*.

The Developing Table.—Any workman of moderate skill can construct the convenient arrangement shown in fig. 1,

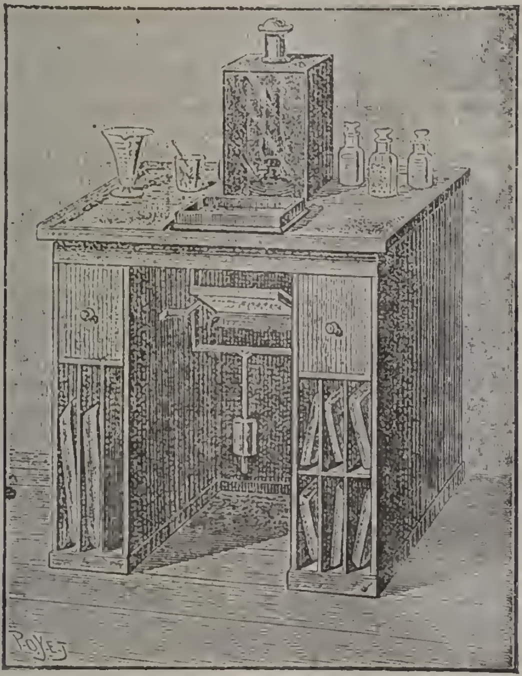


Fig. 1.—Developing Table.

and very little explanation is required beyond that given by the sketch; but it may be mentioned that the developing dish is placed on a rocking tablet, an occasional touch with the knee on the weight serving to keep the tablet in motion. This tablet consists of a plate of stout glass set in a frame, so that if a glass dish is used the progress of the development may be seen at any time by setting to the correct angle the mirror shown over the balance weight.

In figure 2 the arrangement of the lamp is shown in detail. Various coloured panes can be inserted at D, and

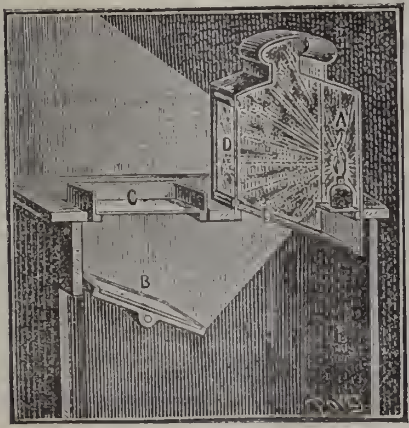


Fig. 2.—The Lamp.

when the light is not required under the rocking tablet the reflector B is turned so as to be in a vertical position.

Vessel for Decanting a Liquid from the Sediment.—The diagram figure 3 almost explain itself, and may be useful for any liquid which is not injured by exposure to the atmosphere; but when the action of the air is likely to be prejudical, it is easy to use a glass bottle, with a tubular near the bottom, instead of using the open topped jar.

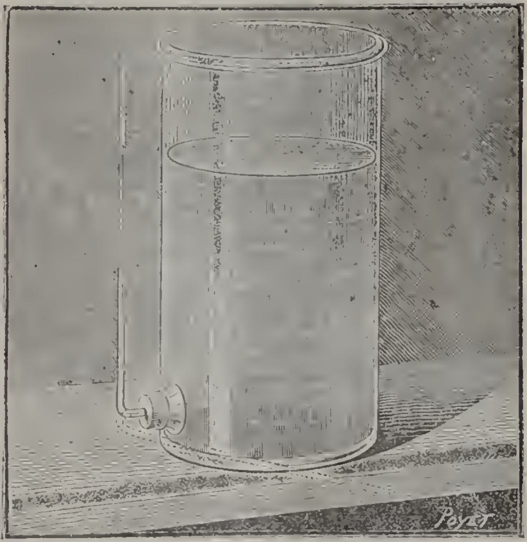


Fig. 3.—Decanting Vessel.

An india-rubber cork is the most convenient to use, and the thin glass tube may be softened for bending by holding it in the flame of an ordinary flat flamed gas-burner.

The Print Washing Trough.—Fig. 4 is made of wood lined with lead (zinc should not be used), and it is divided in two by a horizontal strainer which prevents the prints

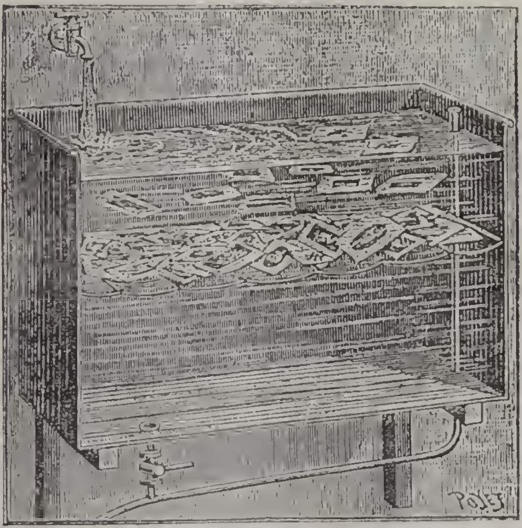


Fig. 4.—Print Washer.

sinking. A constant stream of water is allowed to flow through the apparatus, and it is emptied from time to time by opening the cock which is shown below the trough.

The Print Drying-Rack.—Fig. 5 is merely a frame-work with threads arranged in a series as shown, the prints being held by the small clips now sold at a low price. Such an arrangement of the prints as is shown conduces to rapid and equal drying.

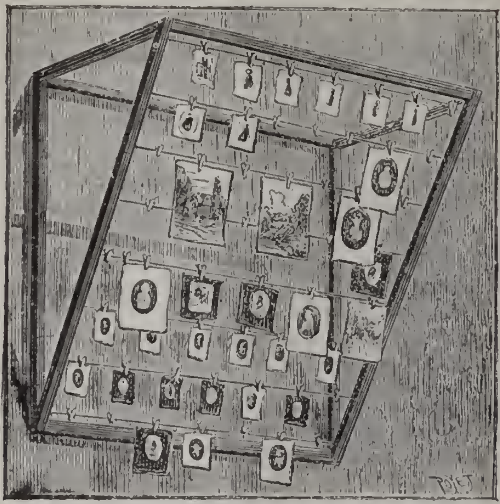


Fig. 5.—Print Drying-Rack.

◆

MARION'S TEN PER CENT. DEVELOPING SET.

Marion and Co., of 22, Soho Square, forward us a neat little case containing six half-pint bottles and two measuring glasses; three of the bottles are empty, the other three being filled with ten per cent. solution—ammonia, pyro, and bromide respectively.

When one works with various plates, the advantages of referring all formulæ to the ten per cent. standard are considerable, and in the box we find lucid directions for converting the formulæ recommended for a representative series of commercial plates.

The set before us is likely to be especially useful to the tourist, who may have to expose in countries where he is uncertain as to the light, or as to the sensitiveness of such plates as he may be able to buy; under which circumstances the development of occasional trial plates is almost imperative. We would suggest that in making future supplies, it might be well to line the recesses in which the bottles fit with the stiff corrugated paper now so largely used for packing.

◆

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.*

VII.—Development of Lantern Slides.

For the development of lantern slides, whether on chloride or bromide plates, yellow light may be safely used. The former are very insensitive to yellow rays, and the writer has even for bromide plates employed yellow light exclusively for a long period. Two thicknesses of golden fabric are sufficient over a paraffin lantern, replacing the gloomy ruby glass usually fitted to such lamps. When a large number of plates are to be developed at one time, daylight is far more convenient than any form of artificial illumination, and the writer has developed many hundreds of bromide plates in a room with a window measuring four feet by three feet, protected by a blind composed of three or four thicknesses of golden fabric. The window faced the north, and the sides of the blind were covered with wooden flanges, which cut off all side light. A curtain of the same material was hung from the wall above the blind roller, effectually stopping all stray rays of white light. The whole room, which measured about fourteen feet by ten feet, was pleasantly illuminated with soft yellow light, and the smallest print could be easily read in any part of it. At first it seemed mere folly to expose even the slowest plates by such a light, but although many gross both of negatives and positives were developed in this room, at various times of the year, not one single plate showed any trace of fog. For the negatives, plates marked "twenty times" were often used, but care was always taken, except on dark winter days, to change and develop the plates at a distance from the window. Once a box of unexposed lantern plates was left accidentally open, within six feet of the window, from Saturday morning until Monday morning. On exposing and developing the plates it was found that the topmost one was much fogged; the next one only slightly so; and the third plate was not in the least veiled, but made a bright, clean lantern slide.

There is no great choice of developers with bromide plates, but both pyrogallic acid and ferrous oxalate may be used. The former gives beautiful results, but demands great cleanliness and neatness on the part of the operator; dirty dishes, dirty fingers, and neglect of abundant washings, will bring only disappointment and spoilt plates.

The soda or potash developers, used in a weaker form than for negatives, answer very well; but the following developer, recommended by Messrs. Fry for their lantern plates, will be found, in neat hands, very satisfactory, and, with slight modifications, is also an excellent developer for negatives:—

Washing soda	2 ounces
Ammonium bromide	20 grains
Water	16 ounces

Add one grain of dry pyro *at moment of use* to each ounce of solution required for development. N.B.—Use alum bath *before* and *after* fixing. Fresh developer must be made up for each plate, or stains will result.

This developer will give what is called the "Ferrier colour," which is much admired. Care should be taken not to carry the development too far, as this form of developer gives great density. Beginners should look through the plate at the window or the lamp to judge if requisite density have been attained. When sufficiently developed, wash three or four times with clean water; then leave the developed plates for a few minutes in a dish of clean water, and next place them in a clean alum bath for five or ten minutes. This bath *must* be well filtered, or particles of alum will stick to the plates and spoil them. After a good rinse, the plates may be transferred to the hypo bath:—

Hypo	1 ounce
Water	5 ounces

All these operations should be carried on in the dark-room, and the plates should not be taken into daylight until the hypo solution has been well rinsed off. For fixing and aluming, grooved porcelain dishes are very convenient, especially when many plates have to be dealt with, as they take up very little room, whereas a dish or dishes to hold two or three dozen lantern plates occupy a large space. Such dishes may be obtained from Mason, of Glasgow, and probably from most dealers in photographic apparatus.

When several dozen lantern slides are to be developed, ferrous oxalate is very convenient, as, with care, several plates may be developed at once in a large porcelain dish. By varying the composition of the developer and the exposure, a tone may be obtained varying from brown to a fine black.

The following, although recommended by B. J. Edwards for chloride plates, will be found one of the best forms of ferrous oxalate developer for gelatino-bromide lantern plates:—

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* Continued from page 566.

No. 1.—Oxalate of potash	....	2 ounces
Ammonium chloride	... ...	40 grains
Water	... ...	20 ounces
No. 2.—Ferrous sulphate	... ...	4 drams
Citric acid	... ...	2 drams
Alum	... ...	90 grains
Water	... ...	20 ounces

Ordinarily, equal parts of the above developer are used, but it is best to begin development with two parts No. 1 and one part No. 2, adding more of No. 2 if required.

In making up ferrous oxalate developers for lantern slides, be careful to use distilled or rain water, to avoid all risk of spoiling the plates by calcareous deposit. For the rinsing water and hypo solutions, soft water should also be used.

The following oxalate developer also gives good tones :—

No. 1. { Ferrous sulphate (sat. sol.)	...	40 ounces
Tartaric acid	...	800 grains
No. 2.—Oxalate of potash (sat. sol.)	...	40 ounces
No. 3.—Ammonium chloride ...	...	10 p.c. sol.

For development use the following proportions :—

No. 1	... ...	1½ drams
No. 2	... ...	6½ drams
No. 3	... ...	3 drams

With care and practice, a number of plates may be developed at once—say ten or a dozen—in a large porcelain dish, and thus save much time. The exposed plates are arranged at the bottom of a clean, dry dish, which should have a perfectly *flat* bottom; and be tolerably deep. The proper amount of developing solution is made up in a glass measure, and poured with a quick, sweeping motion, to avoid air-bubbles, and cover all the plates rapidly. If there be any bungling, so that some of the plates remain uncovered by the developer, patchy marks will be found on the slide when finished. As soon as the developer has immersed all the plates, rock the dish backwards and forwards with a regular motion.

If all the plates have received the same exposure, they will all be developed fully at the same time, when the developer should be poured off, and the plates be flooded with rain-water. After three or four washings, place them in a clean alum bath.

If some plates develop out sooner than the others, examine them by transmitted light, to see if they are dense enough ; if so, let them be passed into a dish of rain-water, and proceed with the rest. There is no need of haste, for the oxalate developers work much slower than alkaline pyro, but the intense colour given to the partially developed plate will often lead the beginner to suppose a plate fully, or even over-developed, long before sufficient density have been attained. To guard against error, every plate should be held up to the light, to judge of its density, and the back must also be examined, to see if there are any traces of an image. If there be none, the plate is not fully developed, no matter how black the image may be on the front.

The developers for gelatino-chloride plates are almost endless, and every week someone proposes a new one. A great variety of tones can be obtained with these plates, but as the tone depends entirely on the exposure, the strength of the developer, and the amount of restrainer used, one good standard developer will answer all requirements ; and perhaps there is none better than the modified ferrous oxalate developer of Mr. B. J. Edwards, noticed above as a good developer for bromide plates. With this developer, as with all others, a short exposure and powerful development give cold tones ; while a longer exposure, weaker developer, and the use of a restrainer, give warm tones. According to the treatment they receive, it is possible to produce tones on chloride plates varying from black to red ; in fact, it is said that an experienced operator can obtain thirteen different tints ; and here they far surpass the bromide plates, which are capable of giving only black or brown tones.

In the Year-Book of Photography for 1886, Mr. J. D. England recommends the following developer for chloride plates, which will produce almost any desired tone by varying the length of exposure and amount of restrainer :—

No. 1.—Oxalate of potash	... ...	13 ounces
Distilled water	... ...	50 ounces
No. 2.—Sulphate of iron	... ...	5 ounces
Distilled water ...	... ...	15 ounces
Sulphuric acid ...	... ...	15 drops
Restrainer.		
Bromide of potassium	... ...	240 grains
Distilled water	... ...	1 ounce

Ordinarily, one or two drops of restrainer to each ounce of developer is sufficient for black tones ; but if the exposure be greatly increased, as much as three drams of restrainer become necessary. This is for red tones, and for the extreme exposure the plate will bear.

When fully developed, wash off the developer, and pass the plates into a clean, well-filtered alum bath, where they should remain ten or fifteen minutes.

Dr. Stolze recommends another form of developer for gelatino-chloride plates, and says it surpasses all others in energy—a quality not always desirable. It is made thus. To a boiling saturated solution of citrate of potash, add oxalate of iron, as long as it is dissolved. Cork the solution up air-tight, and let it cool.

In the Year-Book of Photography for 1886, page 126, Dr. Eder gives several other developers for chloride plates, which are not generally known to the majority of workers ; they are ferrous citrate, ferrous tartrate, and ferrous acetate, and for the formulæ the reader must be referred to the volume of the Year-Book quoted.

It is not possible to give minute particulars of the various applications of the above developers. The worker must experiment by giving different exposures, varying the strength of the developer and the amount of restrainer, noting the effect produced by each change, until familiar with the results obtained. When a large amount of a restrainer, such as bromide of potassium, has been used, the development is slow and prolonged, requiring a great deal of patience to carry it out, and if the bright red tones obtained by this method of treatment be desired, on no account must the development be accelerated in any way.

A word or two as to solutions : always keep a good stock of such solutions as oxalate of potash, sulphate of iron, hyposulphite of soda, acid alum, and such developers as Edwards' ferrous oxalate, ready made up—say in Winchesters, or quantities of forty ounces or fifty ounces, and avoid the annoyance and inconvenience of finding, when about to develop a batch of plates, that you have no developer mixed, or no hyposulphite solution ready. Making up solutions demands both time and care : therefore, at stated times, look over your stock of bottles, note which of them require replenishing, and at once proceed to fill them. After use, let all the measures and dishes employed be carefully washed ; and let the developing trays be occasionally well cleansed with dilute nitric acid, to get rid of dirty deposits. Always use *clean* hyposulphite, and *clean* alum solutions, and throw them away after once using. Success in making lantern slides on chloride and bromide plates depends as much on the operator's cleanliness and neatness, as on his intelligence and skill.

A PHOTOGRAPHER'S HOLIDAY IN NORTH WALES.

BY W. JEROME HARRISON.

Let me see—is the title correct ? *Am* I a photographer ? Some years ago, after spoiling my first hundred plates, I considered myself an expert; but I have passed that stage long ago. To be brief, I belong to the daily increasing army of "amateurs," and I think—yes, I think—I have ridden my hobby hard enough to allow me to claim the title.

In holiday-making I am an advocate of the "total change" system—*i. e.*, let the inhabitant of the plain seek the mountain, the dweller inland disport himself on the margin of the briny, &c. For this reason I have for many years found a special pleasure in spending my summer holiday in North Wales, whose mountains and sea-coast, precipices and waterfalls, rivers and lakes, combine with the accents of a strange language to offer new and varied attractions to one whose home is on the plains of central England.

My "people" always go with me—we make up a round dozen altogether—and how handy the boys (men though, now, some of them) come in for carrying the traps on long walks; while the girls—what should I do without their aid as models?

August is my holiday month, but not from choice. In August crowds of tourists descend upon the land; the rent of lodgings is doubled exactly, and eatables have 50 per cent. added to their prices. Therefore, steer clear of August, *if you can.*

The visitor who goes alone, or with but one or two friends, will probably find it the best plan to stay but a few days at each of half-dozen places; but for a family party, the better plan is to fix upon some spot as head-quarters, and to remain there all the time; making excursions therefrom as desired. In this way I have in years gone by established myself at Prestatyn, Criccieth, Pullheli, and Colwyn Bay. For 1887, I selected Llanfairfechan as the abiding place. Since Liverpool, Manchester, and Birmingham yield the bulk of the family parties to North Wales, it is their newspapers that the seeker for accommodation should consult. Except in August, however, it is perhaps a better plan to come down by a train as early in the day as possible, leave the luggage at the station, and personally exploit for suitable "diggings."

A week before starting, a list (see below) should be drawn up of the articles to be taken. Plates, and all articles of glass, travel safely if packed between clothes in large boxes. A careless porter pitched one of my boxes packed in this way right off the top of a pile of luggage on his trunk upon the platform on to the rails below, without the contents suffering in the least. If packed together, separately, a large stout wicker basket with oilcloth top and leather strap is to be recommended.

Photographic Outfit.

Whole-plate camera (Scovill).
Eastman roll-holder.
Three double dark-slides.
Beck lens, with iris diaphragm; fitted with Place's shutter.
Ditto wide-angle lens.
Dallmeyer lens, fitted with Grimston shutter.
Ditto focussing glass.
Focussing-cloth; mackintosh.
Camera case.
Case for roll-holder and dark-slides.
Sliding tripod (top with screw attached).
Dry-plates; Abney, Derby, and Fry's 60-times; ¼-gross of each (= 108 exposures).
Eastman negative paper, 3 rolls (= 72 exposures).
Rouch's dark tent, for changing and developing plates.
Two papier-maché trays (developing and fixing).
Bottles (10-ounce) of sulpho-pyrogallol, ammonia, and ammonium bromide; all ten per cent. solutions.
Hyposulphite of soda, 2 lbs.
Printing-frame.
Sensitized paper, ¼-quire.
Red blotting-paper, ½-quire.
Sponge.
Mackintosh sheet, 6 feet by 4½ feet.
Folding lamp (Shew's).
Glass measure (3-ounce, graduated).
Minim measure.
Burton's "Pocket-Book for Photographers," and pencil.
Pocket compass.
Flat camel-hair brush for dusting plates.
Round ditto, for use in developing.
Dozen drawing-pins.
Folding plate-rack for drying plates.
Ditto ditto for washing plates.
Chamois leather.
Two dusters.
Ordnance map of district.

A few remarks on this list are necessary. The benefits of negative paper in a roll-holder will be most patent on long walks and trips; while glass plates will probably be preferred for work at head-quarters. For instantaneous work I much prefer glass. The lens cap may with advantage be replaced by Place's shutter, which allows any exposure to be made down to the one-tenth of a second, and has the advantage of allowing any amount of difference to be given in the exposure of adjacent sections of the picture, as foreground and sky, thus allowing natural clouds to be secured with facility. For objects in very rapid motion near the lens—such as leap-frog, divers, &c.—a Grimston shutter will be found excellent. Mine is fitted with three interchangeable diaphragms—$\frac{f}{8}$, $\frac{f}{11}$, and $\frac{f}{16}$.

The brands of dry plates which are named were simply splendid; so was the Eastman paper. The failures—*i.e.*, negatives not worth keeping—were about ten per cent. of the exposures, and were due to such causes as (*a*) incorrect timing; (*b*) subjects badly lighted, misty; (*c*) mishaps, such as corner of focussing cloth catching in shutter, &c.

Developing and printing materials were taken, because it is always desirable to test the truth of one's exposures; the test prints need not be wasted, but can be sent to some stay-at-home friend, or to a professional, to be toned. I usually developed at night, or in the evening, pinning up a blanket or coverlet over the windows. The Rouch's dark tent was very useful for changing in during the day; but the limited room and terrible atmosphere of dark tents are against using them for development.

The mackintosh sheet was used to cover the table used while developing. Old newspapers were spread upon the carpet beneath, and upon these were placed the jugs of water, wash-basins, &c., employed, so that the ire of the landlady was not excited by the stains or "general mess" which are often the results of photographic operations. Sponge and dusters serve to tidy up afterwards.

The Ordnance or Government map is on the one-inch-to-a-mile scale,* and, with the aid of these maps, a compass, and some idea of the point where the sun rises, a good idea as to the disposition of the light at any spot can be formed without an actual visit to the place.

(*To be continued.*)

A VISIT TO THE QUEEN'S PHOTOGRAPHER.

BY "JOHN WORZEL."

"Maria," I says, "as we're in London, why shouldn't we go and be potographed?"

"Lor, John!" says she, "we're too old; and besides, them London potographers are sure to charge a deal more than Smith at Slowcombe."

"I don't know so much about that, old lady," I says, a-winking knowingly. "Look here," I says. And I hands her a Servile Services Stored Catalogue, and tells her to read a page as I pointed out.

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* Stanford, of Charing Cross, is the agent for these maps; they cost a 1s. per quarter sheet of about 150 square miles, and are invaluable to every tourist.

"It's no good, John," says she; "what with the osculation of the railway"—(for we were on the Underground) "and my poor eyes, I can't make out a letter."

"Well, it's just this, Maria," I says, a-taking the vollume again; "here's Queen Victoria's own potographer a-advertising as in consequence of the Jubilee he'll take a cart likeness for eighteenpence."

"Fiddlestick," says she, a-laughing; "that's one of your jokes. The idea of Her Gracious Majesty's potographer a-doing such a thing. Why, it's ridiclous."

"I don't care," I says, "here it is in black and white, and here's the Lion and the Unicorn a-top a-shaking tails at each other to show there's no deception. He's done potographs for all the crowned heads, he says. And we can have our carts 'reduced or enlarged to life size,' which I s'pose he sometimes takes 'em larger than life if they have to be reduced."

My old woman couldn't get over the Lion and Unicorn, and when I told her as the Queen's own potographer took off a discount to them as were members of the Stores, as we'd been a couple of year, she raised no more obsticles, and so out we got at the next station.

"Lor," says she, "why we're in the City, which I should have thought as a royal potographer ought to live somewhere near Buckingham Palace, leastways in St. James."

It did seem strange, but after all, I suppose it wouldn't take a equeery more than half an hour to ride to the City, and fetch him when he's wanted. Well, when we got near the place, we began to feel a bit nervous, and I do think, if Maria had proposed turning back, I should have said yes. But she didn't, for, woman like, now she'd started, she wanted to go through with the job to the end.

"It'll be a mighty grand place, depend upon it, John," says she; "and I shouldn't wonder if there ain't a footman in plush and gold, and hair powder to show us in. I do hope, John, as you'll remember to take off your hat."

"Never fear, my girl," I says; "I think I know what's doo to royalty."

We got to the right number, and looked up and down, but nothing like a grand potographer's could we see. There was a thin slip of a shop window, it's true, with a lot of potographs in it, but, bless me, the whole thing wasn't a quarter the size of Smith's, at Slowcombe.

"Well," says Maria, "it's the name and the number, so we must be right. Perhaps he don't like to be too gorgeous, for fear as the people mightn't like to go in."

There was something in this, I thought, so up the stairs we went, where I must say as how I wondered how her Majesty climbed 'em. I was a bit blown when I got to the top, and glad enough I was to go into the deception room, I think they calls it.

Quite a load was taken off my mind when I found as there was no powdered flunkey, but only a civil spoken young lady.

"Good morning, miss," I says; "me and my wife wants to be potographed Jubilee style, you know—eighteenpence a piece, the same as Her Majesty was took."

I didn't quite understand what the young lady said, but my wife whispers as the jist of the explanation was as Queen Victoria didn't have the eighteenpenny style, but that her photograph was done on a chaney plate.

"Dang it," I says, "t'won't do for me. I'm a bit awkward, and I might drop and smash it the first time I took it in my hands; no, eighteenpence is good enough."

The young lady, I thought, seemed to turn up her nose at the eighteenpenny portraits, and tried to wheedle me into one at half-a-crown; but I'm a bit obstinate, and I stuck to the low price; so giving us a ticket apiece, she tells us to go up to the studio.

As we were climbing more stairs, Maria says to me, "Lor, John, I must brush my hair before I go into the place where the Queen has been. It's only a-showing her a proper respeck."

I do think as it got darker every step we took; however, it was a little lighter when we reached the landing, for the door of a room was open, and we could see inside.

"That's where you can brush your hair," I says, for I caught sight of a looking glass.

"That room?" she says, with a contemptuous sniff.

Which, I must say, it did look dingy, and for all the world like Strapper's easy-shaving shop at Slowcombe, only I think Strapper's is a bit more lively, and the furniture's a bit newer. As for Queen Victoria's potographer's furniture—well, I never did see such a odd lot of things; but I'll be bound as each was a rare and valleyable article, perhaps the last of its kind, you know.

Well, she just tidivated herself up a morsel, and then we climbed more stairs, which I do think it's well called high life the customers belong to—which the Queen's potographer has dutchesses and marchingnesses and the like—for I never went so high in my life. At last we reached the studio, and then a feeling of haw came a-creeping over us.

I didn't know how it was, but when we got in the studio, it came upon both of us at once how Queen Victoria had once been there, and how she must have sat down upon one of the velvet chairs. I don't believe I'm exaggeravating a bit when I say if it hadn't been for a tin basting dish, and a wash-hand basin, and a foot-bath as we saw upon the floor, a-catching of the rain as was a-dripping through the skylight, I do think we both should ha' dropped. You see, the utinsels somehow made us feel that though Queen Victoria's potographer hobnobbed with royalty, and, I dare say, often took a chop with the Prince of Wales, yet after all he was but an ordinary mortal like ourselves.

But I must tell you about the portraits. There was a platform at one end of the studio, and when the young man who was going to take our likenesses told Maria to step up and take a seat on the velvet chair, she looked at me as much as to say, "Isn't it sacriledge to stand on this daisy, which no doubt has been erected for Queen Victoria herself?" But I couldn't see why she shouldn't follow where her most gracious Majesty had set foot before, so I nodded and up she went, though I could see she was all of a tremble.

She sat herself down right at the very edge of the velvet chair, and the young man put a sort of a pitchfork stuck on a rod at the back of her head, wheeled up a box right in front, and, without saying a word a-telling her how to look nice, or anything like that, took the likeness.

When he was gone into the cupboard, which I should like to know what they do in there, Maria says to me, "John," she says, "I wonder whether this is the chair Queen Victoria sat upon."

"Goodness knows," I says; "why don't you ask the young man?"

"I don't like," says she.

"More don't I," I says. "And perhaps he mightn't know; because, depend upon it, when Her Majesty came down here, it was the properiator as potographed her. No assistants would be good enough to take the likeness of Victoria Rejina and Inperativerex."

"That's so," she says, thoughtfully. "John," she says, after a bit, "to make sure, let us sit down on all the chairs as we see in the place."

"That's a good idea," I says; "the young man's in his cupboard and can't see us."

And so we went and sat down on the chairs, but had only got through half of 'em when the young man came out and said as Mrs. Worzel's portrait was first rate. Then I got on the platform and had the pitchfork, and when he was gone away, we went and sat down on the other half of the chairs.

My likeness was as good sa the old lady's, and we went away proud as we'd had our portraits took by the Queen's own potographer.

Just as we got to the station, Maria says to me, "Why

John," she says, "we're Copperative Servile Servicers, and got our tickets, and never had the dishcount off our three shillings."

"Well, I'm danged! we were ninnies. Never mind," I says, "perhaps they'll put the valley of the sevenpence into the work. But lor, Maria, if they don't we mustn't grudge 'em the extra pence. To be took by the Queen's own potographer, and to sit down on the very chair as Queen Victoria sat on, and to have the same pitchfork put to our heads as she had, is worth three shillings, at any rate."

Notes.

The Year-Book of Photography and Photographic News Almanac, which is now in the course of preparation, will be published on the thirteenth of December, this being about a week earlier than the usual time, an arrangement which should enable most purchasers to obtain it before Christmas.

As regards the quality of the Year-Book itself, we may confidently hope that it will fairly and intelligently represent the real progress of the year, and the present condition of photographic work.

Original contributions are invited from all those who can write from actual experience; and those who may be only half minded to communicate to their fellow-workers details of those things which have helped them, or of hindrances removed, are exhorted to err, if at all, on the side of sending us their experiences, as, even in the event of anything sent being unsuitable for publication, no harm will be done.

In the *St. Louis Photographer* there is a long paper by A. St. Clair, which is set down as "intended to be read at the Chicago Convention." The author falls foul of the existing metric system, and sets forth a system which is to have all the merits of the French system, without the objections. It begins by reforming the names of numbers, a thousand being *itek*, a hundred *etek*, ten *atek*, and one *tek*. If these variations—depending on that series of vowel sounds which scarcely two persons pronounce alike—are the best distinctions Mr. St. Clair can invent for such important words, one can hardly wonder that his paper was not read at the Photographic Convention. Fancy trying to distinguish *itek* from *tek* when used by a rapid speaker after a word ending in e, y, or i.

A simple method of engraving on glass or metals is given by G. M. Hopkins in the *Scientific American*. It is as follows:—"The glass or metal to be engraved is cleaned thoroughly, and, to secure the best effects, it should be polished. A paper stencil of the desired form is fastened to the glass or metal plate by means of mucilage of good quality. The pattern should be made of thick writing paper, and care should be taken to see that every part of the paper is thoroughly attached to the plate. Any gum around the edges of the paper should be removed by means of a moist sponge. The exposed parts of the plate must be perfectly clean and free from streaks, otherwise there will be undesirable markings on the finished work."

The plate is now clamped down, plain face downwards, in a wooden box, and equal weights of coarse emery and ordinary leaden shot are put in, when the box is shaken violently endwise, causing the shot and emery to strike the plates at opposite ends of the box in alternation. The shot, in the operation of driving the particles of emery against the plates, become charged with particles of emery, and, together with the loose emery, soon abrade the surface of the metal or glass wherever it is unprotected by the paper, producing a fine matted surface, which contrasts strongly with the polished parts of the surface protected by the paper. After roughening the unprotected parts of the plate, the paper stencil is soaked off, and the plate is dried.

Mr. Hopkins further says:—"To adapt this method to engraving articles having curved or irregular surfaces, the box is left open at the lower end, and provided with a flexible sleeve of soft rubber. The articles to be engraved are held against the sleeve by leather straps."

The author seems to have overlooked the photographic application of this simple and convenient development of the sand-blast process, but the importance of which application we ascertained by very few experiments.

In the first place, we developed an ordinary carbon image of a bold black-and-white device upon a sheet of glass, and treated it with emery and shot, as in Hopkins' method. The ground was soon roughened, and, on clearing off the carbon image with hot water and a brush, the device stood out clearly and boldly as unground glass.

Similarly we treated with emery and shot (this time rather fine emery, and very small shot) a half-tone carbon image printed under a transparency, and developed on glass, and a full series of tone gradations was the result, the deeper shades being most roughened.

One other step was to smear the partially ground surfaces with a vitrifiable colour, and after wiping off the excess to fire at a sufficient heat to soften the colour, this producing a vigorous and permanent image on the glass. We also laid several vitrifiable colours on the same plate, applying each in its required place, and wiping off the excess of all at one operation. When this was fired, a picture showing the gradations in colour was obtained. This process of filling in the colours is quite similar to the method of applying colour to photo-engraved plates, now adopted by the successors of Goupil and Co., in Paris; and, indeed, to an old method of making coloured prints from mezzotint plates.

In spite of the fact that we publish the above methods, we think it very likely that persons may obtain patents for them; at any rate, this will be so if we may judge by the past.

Albert Toft, whose reputation as a sculptor has at any rate not suffered by his fine bust of the President of the Photographic Society, a work much admired in the late Academy Exhibition, has just had sittings from the late Premier, and one may hope to see the result in one of the exhibitions next season.

Mr. Toft—he by-the-bye comes from an old family of plastic artists whose quaint " Toft ware " is to be found in museums and collections—is one of the artistic fraternity who knows how to appreciate and value photography, without making himself a slave to it.

One occasionally comes across odd instances of confusion of ideas among photographic tyros, but we think the palm must be awarded to the amateur who the other day attempted to sensitise carbon tissue by floating it on a bath of nitrate of silver.

We learn from a *Society* contemporary that the pocket instantaneous camera has been much used at the fashionable seaside resorts in France, and that the results are fetching a ready sale. This opens up the question whether the photographer or vendor lays himself open to a legal action, supposing the person photographed objects to being exposed for sale. We fancy that in the French law an action would stand, because a few seasons ago an artist who exhibited a picture in the Salon, wherein he had shown the portrait of a lady taken without her knowledge and permission, was condemned to pay damages to the husband who sued him. In England, such a point, so far as we know, has not been definitely tried. Rumour had it that something of this kind was the ground of action in the case Payne *v.* Stephens, but as the suit never came to an issue in public, it scarcely forms a precedent.

It is curious how, for want of attention to little things, photographs otherwise meritorious may be spoilt. An instance in point occurs to us. A photographer had to photograph the interior of a newly-opened restaurant. To make the picture more real, three or four attendants were arranged about the apartment, and half-a-dozen friends were pressed into service to represent customers. Appointments, napery, cutlery, and glass, were all perfect. One customer was reading a newspaper, another was talking to a friend; only one thing was omitted--not a particle of food was to be seen before anybody. How easy it would have been to have had property chops and potatoes! Photography would have lent itself kindly to the deception. The picture was an admirable representation of a Barmecide feast, but as a recommendation of a restaurant in full working order—the object aimed at—it was a total failure.

The artists who were sent on behalf of the illustrated papers to the dress rehearsal of "Pleasure," at Drury Lane, were much struck by the photographic operations which were being carried on at the same time by the Gaslight Photography Company. The pencil, it was apparent, no matter how rapidly the artist worked, had not a chance with the camera. The opinion was that for such subjects photography was invaluable. "I defy even a 'lightning' artist to get a stage group containing a number of figures on to his sketch-book with anything like absolute accuracy of pose," said one gentleman, "You havn't got four pairs of eyes, and while you are looking down at your pencil, if only for a couple of seconds, the leading lady or gentleman, whom you particularly want to get correctly, has changed her or his position sufficiently to make your first impression utterly useless. Nothing is more aggravating than this. But, so far as I can see, with the camera the difficulty is overcome."

Photography now-a-days performs an important function in connection with gold mining operations. At the half-yearly meetings of mining companies, especially of those where the gold has not made its appearance in the shower which the shareholders expected, it has become a common thing to exhibit photographic views of the mine and of the hydraulic machinery in various stages of completeness, and this evidence of activity is quite sufficient to satisfy the doubts of the anxious investors, especially when coupled with the soothing assurance of the chairman that directly the pumps, the "nozzles," the sluice boxes, and the rest of the modern mining appliances get to work, the returns will be at the very least a thousand per cent. profit.

Not long ago we bade farewell to a party of Englishmen who were going out to Western America in the service of a gold mining company, and we asked why they did not take a photographic outfit with them. "There's not the slightest necessity," replied one; "photographers abound whenever a gold mine is started." This fact seems curious, but an explanation, we fancy, is found in a recent statement by the *San Francisco News Letter*, which, in deploring the deterioration in mining explorers, says that "they have had to give place to a much inferior class of operators—to men whose experience in mining districts has been confined to the peddling of milk, vegetables, or to itinerant photography." Hence it would appear that when a photographer sets out for a gold bearing region, although he starts with taking views of an auriferous tract of land, his ultimate object is to become its proprietor and sell it for a good round sum to an English Company. If this be so, photography in the sparsely-populated Colorado is a much better paying speculation than in our crowded London.

We have, on a previous occasion, noted that the Editor of the *Family Herald* appears to have an intimate acquaintance with photography. This fact also seems to be known to the readers of the popular periodical, for in a recent number we have his answer to a young lady who had written to enquire whether there was anything injurious to health in the manipulation of dry plates in the dark-room. The *Family Herald* is of opinion that a lady may go in for professional photography with safety, and perhaps this opinion is correct in spite of a growing suspicion that ammonia has an injurious effect on the mucous membrane. Only this week we heard an artist who practises photography express a liking for Beach's developer for the reason that he had found ammonia fumes attack his throat.

Apropos of photographic ailments, rheumatism must now be added to the list. The Czar is, so far as we know, the first victim on record. Other photographers no doubt have suffered from this unromantic complaint, but their sufferings have not been deemed worthy of mention in the public press. The Czar, ardent photographer as he is, no sooner arrived in Denmark than he rushed into *al fresco* photography, and while so engaged, experienced a severe chill which has resulted in an attack of rheumatism in the left arm. It would be interesting to have some further particulars about this. A "chill" implies a previous heat and consequent perspiration. What was the Czar doing to get himself into this condition? Was he rushing about, camera in hand, seeking everything he could devour—in other words, taking photographs in all directions—a sort of artistic contest against time? Or did he use 15 by 12 plates, and insist upon carrying the apparatus himself?

As a rule, people are rather sensitive about having their photographs exhibited in a show-case, but there are occasionally exceptions. A lady the other day entered the studio of a suburban photographer, and, after complimenting him upon his specimens, said she wished to have her portrait taken, and enquired what the charge was for a copy to be shown in the case. The request was so unusual that the photographer was taken aback. However, he retained sufficient presence of mind to say that he made no extra charge, the only condition being the quality of the picture. "Ah! then," complacently remarked the lady, 'I think I will sit, but you must be sure and do a nice photo of me, because I want it exhibited." The photographer looked aghast, for the lady was not at all fair, neither was she fat, and she certainly was forty, and perhaps a few years more. She had high cheek bones, decided wrinkles at the corners of the eyes, a falling-in of the mouth, and showed an inordinary quantity of neck; long, lean, and scraggy, and with promised salt cellars near the collar bone.

The photographer did not like to lose a customer, so he took the lady's photograph, but up to the present he has not dared to exhibit the result. Every week he receives a visit from the lady, who anxiously enquires when her portrait will appear, and he is obliged to put her off with some excuse. How long this species of persecution is going to last he does not know, but the lady shows no signs of tiring, and he is at his wits' end what to do. This painful episode is but an additional proof, if one be needed, of the curious fact, within every photographer's experience, that plain people have not the least objection to being exhibited, while good looking persons almost invariably dislike it. This is very hard upon the photographer, who naturally likes to show only the portraits of his handsome customers; it furnishes, however, a reason why ugliness so often distinguishes the bulk of the specimens in the average show case.

The *Daily News* comments upon the Notes in these columns last week in reference to the effects of the competition of the club system on suburban photography. Our contemporary says, "There is an obvious remedy for the suburban complainant, but it does not seem to occur to him. It is that he, too, should try a club system, or search out some new inducement to people to come and be photographed." The *Daily News* has here stumbled upon the problem which photographers have been trying to solve for some years past. That "new inducement to people to come and be photographed" is exactly what is needed, and the whole profession, from the biggest man to the smallest, would be only too grateful if the *Daily News* could suggest the "new inducement." It is too true that people now-a-days have to be dragged, metaphorically speaking, to be photographed. The slightest excuse is sufficient to make them back out, the least obstacle will prevent them journeying to the studio.

This is why the City club photographer has such a pull over the suburban man in respect to the employées in City warehouses. He is on the spot to begin with. The employée can run in during the dinner hour, and if it be the summer time, can call immediately business is over. With the suburban man, the first case is out of the question, and in the second it is generally too late when the employée reaches home. His only chance is on Saturday afternoon, and here again the City photographer has the advantage, because his handiness of situation does not interfere with the Saturday afternoon excursion. A visit to the suburban photographer, on the other hand, might mean the sacrifice of the excursion. The suburban photographer does his best, we believe, to start clubs, but his facilities are very small in comparison with those of his urban rival.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.*

Chapter XIII.—Lenses—Mode of Using Telescope Objectives—Petzval's Portrait Lens—Single Landscape Lenses—Petzval's View Lens—Sutton's Panoramic Lens—Dallmeyer's Triplet.

In the earliest days of photography, before special lenses were to be obtained, it was usual to employ telescope objectives. But these lenses were ill-suited to the purpose, though their performance in a telescope might have been unexceptional, because the picture viewed through the eyepiece of a telescope is very small, not so large as the objective itself, while the picture produced in the camera is often required to cover a comparatively large surface. The rays that pass obliquely through the objective in a telescope are not utilised, but in the camera the oblique rays form by far the greater part of the image.

To increase the covering power, the objective was turned round, and a diaphragm was put in front of it. (See fig. 16.†) But with this assistance the image produced with a lens of given focal length is not large enough to satisfy modern requirements. The diaphragm obviously diminishes the light, and it also distorts the image, as will be subsequently shown. With such an arrangement, also, the image of a flat object is curved like the inside of a saucer, and the chief of the light which acts photographically is brought to a focus at a considerable distance from the visible image.

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* Continued from page 583.

† In all the figures the arrow indicates the direction of the light in passing from the object to the image; that is, the arrow points *into* the camera. The curves of the lenses are not drawn to scale.

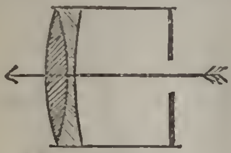

Figure 16.

In these and in other ways the existing lenses were faulty when applied to the new art. The chief corrections desired were a larger aperture for the sake of rapidity, a larger and flatter field, the chromatic aberration corrected in an especial way, namely, the most intense of the photographically active rays brought to focus at the same point as the most intense of the visible rays, and distortion reduced to a minimum or completely eliminated.

The larger the aperture, other things being equal, the smaller the field, and so it has been found convenient to perfect lenses in two directions, some with a small aperture and therefore slow in action, but covering a large field; and others with a large aperture and consequently rapid, but producing a comparatively small picture. The first are classified as view lenses, the second as portrait lenses, while a lens of medium properties is called a universal lens, or a view and group lens. There is nothing scientific in these distinctions. Under certain conditions a view lens is far superior to a portrait lens for taking portraits, and portrait lenses have often been used for taking views. By common consent lenses whose apertures are about one-sixth of their focal lengths are called universal, or portrait and group lenses; if the aperture is one-eighth it is a view and group or simply a view lens; if quicker than the first of these it is a portrait lens, if slower than the second a view lens. Variations from these rules will be found, but they tend to deception unless they are accompanied by an explanation.

The first improvement on the telescope objective arranged as described above, was by J. Petzval, the invention of whose portrait combination was one of the two epochs in photographic optics. This lens was constructed by Voigtlander of Vienna, under Petzval's instructions, in 1841. It is shown in fig. 17. The focal lengths of the posterior and anterior combinations are as 3 to 5, and the combinations are separated a distance about equal to half the equivalent focus of the whole lens. The chief point about this lens is the great gain in rapidity got by shortening the focal length, and using the full aperture without a diaphragm. The focal length is shortened by having two combinations instead of one, and the spherical aberration is so cured by means of the separated back combination that a diaphragm is rendered unnecessary. The multiplication of surfaces, six instead of two, causes loss of light, and also adds to the diffused and false light in the camera.* It is stated that Andrew and Thomas Ross (father and son) worked out a photographic objective with separated combinations, a device suggested by Thomas Ross to gain in flatness of field, and that this lens was constructed by them shortly before the Petzval lens was introduced.

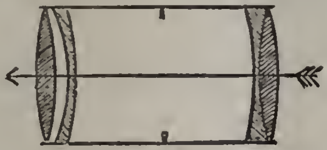

Figure 17.

In 1857, T. Grubb introduced his "patent aplanatic" lenses. He gets a deeper separating curve between the components of the single lens by making the crown lens a meniscus, and putting it in front instead of behind the flint lens, as in fig. 18. By means of this deeper separating curve he claims that the "spherical aberration is nearly corrected," and that, therefore, a diaphragm with a larger aperture may be used than was possible with the old form of view lens.

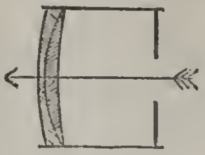

Figure 18.

The single landscape lens was further modified in 1864 by J. H. Dallmeyer, who used two crown glass meniscus lenses of focal lengths as 1 to 3, and cemented the flint lens between them, as in fig. 19. This gives an additional surface for correction of the aberrations, so that it is possible to get a better correction of the oblique pencils, and it also has the minor advantage that the softer flint glass is protected on both sides. The lenses of this series have maximum apertures varying from $\frac{f}{15}$ to $\frac{f}{30}$.

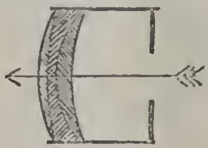

Figure 19.

In 1886, Dallmeyer issued another series of single landscape lenses of somewhat similar construction to those last described. They differ in including a smaller angle (that is, for the same covering power they have a longer focal length) and in working at twice the rapidity, $\frac{f}{11 \cdot 3}$. The diaphragm is, of course, larger, and it is placed further from the lens to give greater flatness of field (fig. 20.)

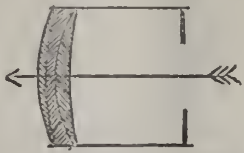

Figure 20.

The anterior convex meniscus is of extra light flint instead of crown, and the anterior surface of this lens is less curved than in the wide angle lens.

The desire for a lens to cover a larger field stimulated J. Petzval to work out another lens particularly adapted to landscape work. In 1858, Dietzler, of Vienna, issued the new lens under Petzval's directions, for Voigtlander and Petzval had disagreed since they worked together at their portrait lens. Petzval's fame secured an immediate and warm reception for the new instrument, and it was copied by many opticians of repute, who christened their productions variously as orthoscopic, orthographic, caloscopic, &c. Fig. 21 shows the lens as made by the American optician, Harrison. It will be observed that Petzval has adhered to his first principle of a separated back combination, but in this case the combination is negative or diverging, and therefore makes the focal length of the whole lens longer than that of the front combination.

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* I intended to give some idea at least of the angle of view of each lens—that is, the extent of field covered—but I find this quite impossible except by an actual test of every instrument. Thus I have at the present time two lenses of well advertised and quite modern makes, one stated to cover 9 by 7, and the other 12 by 10. The 9 by 7 will cover 12 by 10, while the 12 by 10 lens will only cover 10 by 8; and taking the same apertures and fields, the 9 by 7 lens is far superior in definition throughout the field. On the other hand, the maker of this 12 by 10 lens does not always overstate the covering power of his lenses, for I have another of his make which he calls 5 by 4 that will cover 8½ by 6½.—C. J.

After experience with this lens, the foremost landscape photographers of the day pronounced it not so useful to them as the single landscape lens, and found that it required a smaller stop. The orthoscopic lens gives pincushion distortion, but to only a slight extent as compared with the opposite, barrel-shaped distortion of single lenses with the diaphragm in the front.

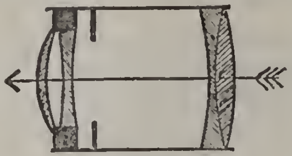
Figure 21.

In 1859, Derogy advertised a photographic objective giving in the one instrument three portrait and three view lenses, the necessary changes being made by means of bayonet joints. This *multum in parvo* method has also been adopted by Jamin, Melhuish, Darlot, the Scioptieon Company, and perhaps by others.

In 1859, Thomas Sutton patented his panoramic water lens (fig. 22) for use with long curved plates. It was achromatic, and from its spherical form would transmit oblique rays almost as perfectly as the central pencil. Besides the obvious drawbacks to lenses containing fluids, such as leakage, there is the impossibility of preserving the temperature of the liquid uniform, and a change in temperature means a change in refractive power. In 1861, T. Ross bought the patent rights of this lens, and issued copies to the public. Other fluid lenses, as they are called, have been constructed.

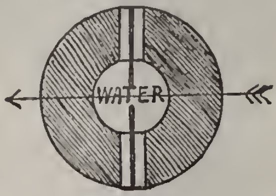

Figure 22.

In 1860, J. H. Dallmeyer introduced his quick-acting single lens for stereoscopic pictures, modifying the curves as shown in fig. 23, that it may work with an aperture of $\frac{f}{10}$, and yet not suffer to a practically injurious extent from spherical aberration. W. Wray, since 1886, has issued a series of single lenses suitable for all the ordinary sized plates, of which fig. 23 may be taken as a general representation. Rapidity is here also the especial feature, the series having a maximum aperture of $\frac{f}{10}$, except the larger sizes, which work at $\frac{f}{8}$. This last aperture, however, does not give what is commonly called a sharp picture, and is useful chiefly in large direct portraits. The introduction of a certain obvious amount of spherical aberration, with its concomitant loss of sharpness in the picture, is sometimes desirable in order to gain what could be got no other way so well. This matter will be subsequently referred to.

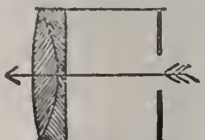
Figure 23.

In the same year (1860) the celebrated triplet lens of J. H. Dallmeyer was constructed. This was the first lens attaining to any degree of appreciation that was specially adapted to views and copying, and gave a picture free from curvilinear distortion (see fig. 24). Its three combinations are each achromatic, and the central combination, which is diverging or negative, serves to flatten the field. By removing the central combination the focal length of the whole lens is reduced, and its aperture, originally $\frac{f}{15}$, is enlarged sufficiently for portraiture.

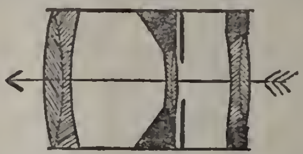
Figure 24.

The need for a non-distorting view lens was now fairly appreciated by opticians, and within the next six years this want is catered for in a way that the subsequent twenty years has not been able to better.

It is fitting to state here, that other lenses than those described were suggested or constructed, but that space does not allow us to include what would be only interesting, though such details would be necessary in an attempt to compile a complete history of photographic objectives. This remark will apply also to the next chapter.

(*To be continued.*)

CHAPTERS IN THE HISTORY OF PHOTOGRAPHY.

BY W. J. HARRISON.*

[*Reprinted grom the Photographic Times.*]

The Collodion Process.

Discovery of Gun-Cotton.—Schönbein, the famous Swiss chemist, discovered, in 1846, that when ordinary cotton is soaked in a mixture of nitric and sulphuric acids its properties become greatly changed. The explosive substance so obtained received the name of gun-cotton, or insoluble pyroxyline. When the acids were slightly dilute, or when the time of soaking was very short, a less dangerous compound was obtained, which was known as soluble pyroxyline.

Preparation of Collodion.—In the next year—1847—an American investigator, named Maynard (of Boston), showed that when soluble pyroxyline was dissolved in a mixture of ether and alcohol, a somewhat viscid liquid was produced, to which he gave the name of collodion. When this collodion was poured out upon a level surface, as that of a sheet of glass, the ether quickly evaporated, and a delicate skin or film was left behind When dry this film was fairly tough and horny. It formed so admirable a covering for bruises, &c., preventing the access of air, that it speedily became of use in surgery.

Collodion introduced into Photography.—In 1849 a Frenchman, Gustave Le Gray, suggested that collodion might prove useful in photography. In his book—which was translated into English in 1850—he writes, "I have just discovered a process upon glass by hydrofluoric ether, the fluids of potassium and soda dissolved in alcohol 40 degs. Fahr., mixed with sulphuric ether, and afterwards saturated with collodion; I afterwards react with nitrate of silver, and thus obtain proofs in the camera in five seconds in the shade. I develop the image with a very weak solution of sulphate of iron, and fix with hyposulphite of soda."

Another early investigator in this line was Robert J. Bingham, who, as assistant to the great Faraday, made the acquaintance of collodion immediately on its introduction into England in 1847. In a book published in 1850 he gives, first Herschel's method, then a method with albumen, then one for coating glass plates with isinglass, and finally adds, "We may, in place of the gelatine (isinglass), employ a number of other substances to form an adherent film upon the glass. The following are a few of those we have experimented with and found to answer moderately well—gluten, collodion, varnishes, &c." But although Le Gray and Bingham may take credit for having been the first to *suggest* a possible use of collodion in photography, yet the merit of the invention and publication of the collodion process belongs entirely to Frederick Scott Archer; his article describing this method first appearing in a London periodical called *The Chemist*, in March, 1851.

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* Continued from page 411.

Life of Scott-Archer.—Born at Bishop Stortford, in 1813, Archer was apprenticed to a silversmith in Leadenhall Street, London. His tastes were artistic, and on attaining manhood he became a sculptor. It is said that his early attempts at photography, by the calotype method, about 1847, were stimulated by his desire to employ the art to secure mementos of the productions of his chisel. In September, 1850, Archer's new process was so far advanced that he communicated it to his friends, among whom were Dr. H. W. Diamond, Mr. P. W. Fry, and others, from whom he received much assistance. Probably Archer did not realize the importance of his discovery, for he did not attempt to patent it; although in 1855 he patented a method of removing the collodion film from glass by coating it with gutta-percha, an improvement which had little or no practical value.

So good and complete was Archer's method, that in three or four years it practically displaced both calotype and Daguerreotype, and reigned supreme from 1855 to 1880. The inventor took up photography professionally, opening a studio in Great Russell Street, near the British Museum; but he made no money by photography, for his brain was too busy in devising new things to reap the benefit of that which he had already accomplished. Among other inventions devised by Archer, we may name a camera within which the plates could be developed and fixed, as well as exposed; a triplet lens; and a useful method of whitening positives on glass by soaking them in mercury bichloride; this was called the "alabastrine process."

Scott Archer died in May, 1857, and was buried in the suburban cemetery called Kensal Green. A subscription of £747 was raised for his widow and little children; but, as Mrs. Archer died shortly afterwards, the amount was settled on the children, together with a government pension of £50 per annum awarded on the ground that their father was "the discoverer of a scientific process of great value to the nation, from which the inventor had reaped little or no benefit."

Outline of the Collodion Process.—The following account is taken from a small book—"Manual of the Collodion Photographic Process"—published by Archer in 1852; a second edition appeared in 1854.

1. Immerse 80 grains of cotton wool in a mixture of one ounce each of nitric and sulphuric acids; take out after fifteen seconds, and wash thoroughly in running water.
2. Dissolve the pyroxyline so obtained in a mixture of equal parts of sulphuric ether and absolute alcohol. The solution so obtained is ordinary collodion.
3. Add some soluble iodide—usually iodide of potassium—to the collodion. A little potassium bromide may also be added.
4. Pour the iodized collodion on a perfectly clean glass plate, and allow two or three minutes for the film to set.
5. Take the coated plate into the dark-room and immerse it in a bath of silver nitrate (30 grains to every ounce of water) for about a minute. Here a chemical change takes place by which silver iodide is formed in the pores of the collodion.
6. Remove the plate, which is now sensitive to white light, place it in a slide holder, and expose it in the camera. The time of exposure "may vary from one moment to a quarter of an hour."
7. Take the plate back to the dark-room and develop it by pouring on it a mixture of water, one ounce; acetic acid, one dram; pyrogallic acid, three grains. Archer claims that "the great power shown by pyrogallic acid in bringing out the latent image was first made known by me in a short description in the May number of *The Chemist* for 1850."
8. Fix the image by soaking the plate "in a strong solution of hyposulphite of soda." At a later period cyanide of potassium was preferred by most operators for this purpose.

Collodion Positives.—When a single picture only was desired, a short exposure was given, and the deposit of metallic silver which forms the image was whitened by soaking the developed plate in mercury bichloride. When a black surface was then placed behind the photograph it stood out on the glass in correct black and white as a positive image. Probably every household has specimens of such collodion positives, of which large numbers were produced between 1854 and 1870. An American improvement consisted in the use of thin plates of black or chocolate enamelled iron—ferrotypes, irreverently called tintypes—or sheets of black japanned leather, instead of glass. Itinerant photographers still employ this positive method largely, since by it they can complete and hand over their productions to their clients within a few minutes.

For making lantern slides the wet collodion process is still considered one of the best, if not the best method.

Popularisation of Photography.—Up to about 1853 a photograph was considered a curiosity, but the introduction and perfection of the collodion process made photography, for the first time, a really popular pursuit. With mistaken ideas as to the ease of the new method, large numbers of amateurs purchased the necessary materials, and about 1858 the camera became as common an object as the barrel organ.

But with the practice of photography came the sad knowledge that there is no royal road to the taking of good pictures. Although money might be lavishly spent in the purchase of costly apparatus, yet it was soon found that some knowledge of chemistry, and some artistic taste, together with practice in manipulation, and neatness and accuracy in working, were indispensable to success. Moreover, the chemicals employed—more especially the silver nitrate—had ways of marking the apprentice to photography: stains of inky darkness upon the hands and clothes soon earned for the infant science the appellation of the "black art."

Thus the popularity of photography—as an amusement for amateurs—declined almost as rapidly as it had risen. Still some lasting effects of the first photographic boom remained. The Photographic Society of London,[*] established in 1853, has always exercised a favorable influence on photography in Great Britain; while our two old weekly periodicals, the *Photographic News*, dating from 1858, and the *British Journal of Photography*, 1859 (as a monthly from 1854), have steadily led the way in endeavoring to make photography more and more a science, and in showing that it is something better than a mere mechanical pursuit, or means of getting a livelihood.

ANNUAL EXHIBITION OF THE AMATEUR PHOTOGRAPHIC ASSOCIATION OF VICTORIA.

[FROM A CORRESPONDENT.]

The Fourth Annual Exhibition of the Association was opened at the Royal Society's Hall, Melbourne, on 19th July, the display of exhibits being large and varied, and showing to great advantage the progress made by the Association during the last twelve months.

Among printing processes on paper, silver prints, as a matter of course, carried off the palm for quantity, but carbon, gelatino-bromide, platinotype, and gelatino-chloride were also represented.

Several window transparencies on gelatino-bromide, also stereoscopic and lantern transparencies on bromo-chloride plates, were noticed.

Stereoscopic photography is pursued by a large number of the members of the Association, and the results which they produce create great interest amongst those members who have not taken up this delightful branch of photography. Their labours are also very attractive to the general public who patronise the exhibitions, as the marvellous power of the stereoscope is a thing unknown—or almost so—amongst the "rising generation." J. Musgrove's fine set of stereo-transparencies exhibited in the revolving stereoscope, together with a revolving frame of his own invention which shows the negatives, with silver and carbon prints and transparencies from the same, side by side, made his table a centre of attraction each evening. E. C. Bell occupied another table, upon which he had mounted eight stereoscopes supplied with over 300 stereographs. Messrs. E. A. Walker and J. H. Harvey also exhibited a collection of stereoscopic slides.

A great feature of the exhibition was the very small amount of instantaneous shutter work shown, only three or four members exhibiting in this class. This may be taken as a natural consequence of the rage for snapshots which existed a few years ago. Many have become alive to the fact that instantaneous work—of a sort—is as easy of accomplishment by the tyro as by the experienced photographer, and have consequently abandoned the practice of advertising the plate makers, by telling wonderful tales of the exceedingly short exposure "such-and-such" a subject had received. The principal instantaneous exhibit was a set of their famous yacht studies which had been kindly lent to the Association by G. West and Sons, of England; these were universally admired, and formed one of the gems of the exhibition.

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[*] Title changed to Photographic Society of Great Britain in 1876.

The leading enlargements of portrait and landscape work shown were by J. Musgrove; these were printed in carbon, having been enlarged from stereo size to about 15 by 12. A set of views of the local "Zoo" attracted much attention, being the work of Miss A. J. Cooper, the only lady member of the Association.

The chief architectural work shown was produced by F. A. Kernot, J. H. Mulvany, and J. H. Harvey. Messrs. Mulvany and Kernot showed various buildings around Melbourne and suburbs; Mr. Harvey having sent in a frame containing similar interior views of the Houses of Parliament, Melbourne, to those he showed last year, with several additional interiors of this stately building which he has obtained since; he also showed other whole-plate views of public buildings in various parts of the colony, together with a frame illustrating scenery in and around Sydney.

Portrait work was poorly represented, although there were a few excellent specimens shown here and there.

J. Lang's landscapes—several of which were printed in platinotype—are worthy of mention; he had printed duplicates of many of these in silver, and the results, being placed together on the walls, formed an interesting study. Amongst landscapes, a fine set, kindly presented to the Association by James Swift and Sons, of London, illustrated work done with their lenses. This firm also sent a print of the famous enlargement of the proboscis of the blow-fly, executed by M. J. Swift. The Philadelphia Amateur Photographic Club was represented by a number of silver prints of all sizes, many of them being of great beauty as artistic studies, as well as technically faultless. A large collection of prints and lantern slides was sent by the Queensland Photographic Association, illustrating life and scenery in that colony.

The lanterns of the Association, under the charge of J. H. Harvey, were located in an adjoining room, and at intervals during each evening a number of slides were exhibited, illuminated by the limelight.

The photographic material dealers sent good assortments of novelties, and interesting pieces of apparatus, which were shown in a third room.

It was generally agreed that the Exhibition was the best yet held by the Association, both on account of the quantity and the quality of the work shown.

In the competitions the awards were made as follows:—Large landscapes—1st, J. H. Mulvany; 2nd, J. Lang. Groups and portraits—1st, G. F. Fullarton. Architecture—1st, J. H. Harvey; 2nd, F. A. Kernot. Small landscapes—1st, C. Harper; 2nd, G. F. Fullarton; 3rd, J. H. Mulvany. Enlargements—1st, Jas. Musgrove

Efforts have been made on two or three occasions to induce British Amateur Associations to forward work to the exhibitions of this Society, but have failed. The case has been different with American societies which have been invited: they in general have assented. Why is this?

Patent Intelligence.

Application for Letters Patent.

12,521. Joseph Brown, Cluny Lodge, London Street, Norbiton, Kingston-on-Thames, Surrey, for "Improvements in the preparation of films for photographic purposes in monochrome or polychrome."—September 5th, 1887.

12,608. Michael Muir Scott and Thomas Scott, Junior, 36, George Street, Edinburgh, for "Photo-etching; that is to say, an invention for the production by photography of portraits or pictures having the characteristics of copper-plate etchings."—September 17th, 1887.

Official Abstract of Accepted Complete Specification.

O'Reilly, 15,187 of 1886. "Camera convertible to enlarging apparatus, or magic lantern, by making bellows body removable."

Elliott, 1637 of 1887. "Slides made of thin metal or other sheets stamped out, and in one or several pieces."

Edwards (*Brand*), 16,012 of 1886. "Printing-frame fitted in pane of darkened window; hinged frames and covers inside and out."

O'Reilly, 15,187 of 1886. "Camera convertible to enlarging apparatus, or magic lantern, by making bellows and other parts removable."

Thornton, 14,421 of 1886. "Case for holding lens diaphragms attached to side of camera."

Patents Granted in America.

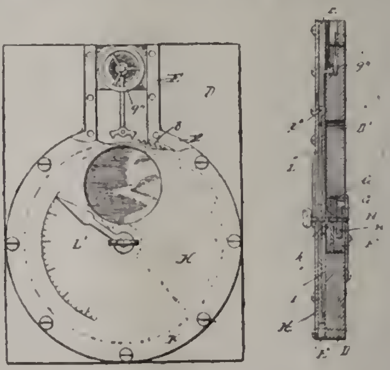
368,930. Charles P. Call, Boyne, Mich. "Self-timing photographic-camera shutter."—Filed February 24, 1887. Serial No. 228,717. (No model.)

Claim.—1. In a photographic camera, the combination, with a plate D, a frame and front plate forming a dial, an interior shutter, and operating clock mechanism of a time-plate provided with a ratchet adapted to engage with an escapement, spring, and balance-wheel, and catches J J', substantially as shown and described.

2. In a photographic camera, a front and rear plate and intermediate shutter, and time-plate having teeth upon its periphery adapted to engage with an escapement and adapted to open the shutter instantaneously, in combination with a spring and winding-posts, and means for regulating the revolution of the time-plate and shutter, substantially as described.

3. In a photographic camera, the combination of the rear and front plate, the front plate having figures placed thereon, and a hand secured to a winding-post, the intermediate plates partly cut away, and ratchet-teeth adapted to engage with an escapement, substantially as shown and described.

4. In a photographic camera, the combination of a rear plate and a front dial-plate and intermediate shutter, and time-plate provided with a ratchet, said plates being operated by clock mechanism and regulated so as to be instantaneously or otherwise opened or closed, substantially as set forth.



5. In a photographic camera, the combination of an inner plate and an outer indicating-plate, the intermediate time-plate and shutter, slot *i*, lugs *i'*, adapted to engage with said slot and secured to a spring, winding-post H', and escapement-spring, and balance-wheel actuated to engage with teeth on the time-plate, whereby a shutter may be closed instanstaneously or slowly, and apertures formed in said plate adapted to register with the tube, substantially as shown and described.

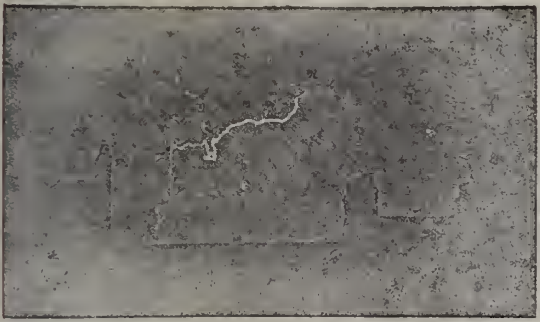
6. In a photographic camera, the combination of a front and rear plate, and intermediate revolving plates, one of said plates being provided with ratchet-teeth adapted to engage with an escapement, and indicating hand and dial, whereby the opening of the shutter can be turned for an instantaneous or slow movement, substantially as described.

7. The combination, in a shutter for photographic cameras, of a front plate and connecting under-plate having ratchet-teeth, shutters to be automatically and instantaneously opened or closed, and a dial representing fractions of a second corresponding with the number of teeth on the revolving plate, and by setting the indicator a shutter may be instantaneously opened or closed, substantially as described.

Correspondence.

A PHOTOGRAPH OF LIGHTNING.

Dear Sir,—Enclosed I beg to hand you a photo of a flash of lightning taken by myself on the evening of the great storm, August 17th last.—I am, dear sir, yours faithfully, A. W. Bates.



127, *Upper Richmond Road, Putney, S.W., Sept.* 14. 1887.

THE CORNWALL EXHIBITION.

Sir,—I wish to correct an error, in your last issue, with reference to my exhibits at the Cornwall Exhibition. They are criticised as enlargements, whereas they are all direct from life on twenty-five inch plates. I am anxious to know if this is an error on the part of the judges, or merely a mistake your correspondent has fallen into. Trusting you will, in justice to me, insert this in your next issue,—I am, yours obediently, W. Crooke.

103, *Princes Street, Edmonton, September* 19*th.*

DUBLIN EXHIBITION—ENLARGEMENTS.

Sir,—In the letter you were good enough to insert a couple of weeks ago, intimating that 15th prox. was last day for receiving exhibits, I inadvertently omitted to mention that the Committee had decided to give a *special medal* for enlargements *bonâ fide* the work of amateurs, in addition to those mentioned in the Prospectus. Pictures intended to compete for this medal must be distinctly marked (preferably in red) on label, "*Amateur Enlargement for Special Medal*," otherwise they will be placed placed in the open division.—Yours truly, Greenwood Pim,

Hon. Sec. Exhibition Committee.

(The judging of all the pictures will be intrusted to two well-known members of the Royal Hibernian Academy, in conjunction with one or more skilled photographers.)

A PHASE OF COMMERCIALISM.

Sir,—With reference to the "Photographer's Indispensable Handbook," reviewed by you last week, allow me to point out the very unfair way in which the London Stereoscopic Company have appropriated my well-known shutter the "Volute."

This is described in the above-mentioned publication, page 165, as the "*Evolute*," and as being the production of the London Stereoscopic Company, whilst it is entirely my own property; and though the London Stereoscopic Company have *bought* a few of these shutters, it seems singular that I should be entirely ignored as the inventor, though actually my own original block has been used to illustrate the instrument, and with my own name, the "Volute," on it.

Having surrendered no proprietary rights concerning this instrument to the London Stereoscopic Company, I must let you and the photographic public judge of this way of appropriating other people's inventions without their sanction or knowledge.—I am, sir, your obedient servant, J. R. Gotz.

19, *Buckingham Street, Strand, September* 21.

Proceedings of Societies.

Photographic Society of Great Britain.

A meeting was held on Tuesday, the 20th inst., at the Gallery, 5a, Pall Mall East, W. F. Donkin (hon. sec.) in the chair.

G. Scammel inquired whether anyone had been successful in mounting prints in a book by the plan recently recommended by M. Stebbing, namely, soaking the photographs in a mixture of alcohol, glycerine, and water before applying a mountant, in order to prevent unequal expansion ?

W. E. Debenham failed to see how moisture could be removed after such treatment.

In the course of a short discussion upon mountants generally, it was stated that there were about forty varieties of starch, but a microscopic examination was necessary to distinguish them.

A. Spiller said the chief adulterating agent used with starch was plaster of Paris ; as much as sixty per cent having been found in one manufacturer's sample.

A. Pringle spoke of an attempt to dislodge the colour in a film dyed with erythrosene by means of dilute hydrochloric acid : after soaking in water the colour returned. The process was repeated again and again with a similar result.

Another speaker said that the brown stain arising from pyrogallol development could be removed and redeveloped in the same manner.

A. Cowan stated that when lately engaged in fixing a gelatine plate in a ten per cent. solution of sulphocyanide of ammonium, he found the latter agent to be a solvent of the film ; in fact, it was so energetic that the process of fixing was not completed.

Two paper negatives were handed round to illustrate failures in manipulation. One showed a dark brown stain which was attributed to defective immersion in the fixing solution, and the other presented a metallic appearance in the shadows, said to be due to under-exposure and the employment of a too concentrated alkaline developer.

J. D. England mentioned an experience wherein the use of ordinary water in development gave rise to black marks in the negative: distilled water proved a remedy.

In reply to a question, A. Pringle said that he found a distinct advantage to accrue from the method of developing by two solutions when the subject was a badly lighted glen or interior, but not for ordinary work. He then spoke in terms of praise of the substance named meta-bisulphite of potash as a preservative of pyrogallol. It fulfilled this condition perfectly after being mixed for several months, and very much less might be used than the proportion originally recommended.

Several others bore testimony to the superior qualities of this agent over that of sodium sulphite, but it was suggested that in effect it was merely an acid sulphite, and the advantages claimed were obtainable with either potassium or sodium sulphite, provided they be rendered distinctly acid with sulphurous or citric acid.

The adjourned special meeting to consider alterations in rules will take place on the 11th October, and the next technical meeting on the 25th October.

London and Provincial Photographic Association.

A meeting was held on Thursday, the 15th inst., W. England in the chair.

The Hon. Sec. showed a roll of ready-sensitized paper which he had kept for two years in a dry cupboard; when opened, only the outer sheets had discoloured.

A. Mackie remarked that paper of this kind which has been kept a long time gave better prints from weak negatives than a newer sample would do.

F. A. Bridge was of the same opinion; he always kept old paper in stock for special negatives, and found it toned just as well afterwards.

A. L. Henderson preferred to fume paper rather longer than usual when he wished to print from weak negatives.

The Chairman advocated printing this class of negative in a very weak light.

W. E. Debenham differed from the Chairman in this respect; he held that a feeble light offered no advantages over a stronger, for the purposes of printing out.

E. Clifton alluded to an experiment in printing by development, wherein the source of light had been diminished by varying the distances, and a corresponding longer exposure given as the squares increased. The resulting prints were alike.

A. L. Henderson said that a print made in direct sunlight would be much redder than one produced in the shade, other conditions being equal.

This led to a desultory discussion on bronzing in the shadows of prints from dense negatives, and illustrations were given by the Chairman, A. L. Henderson, F. A. Bridge, and others. The reproduction of dense negatives was also spoken of, but opinions differed on the advantages of a strong light over a prolonged exposure in a weak light for securing the best result.

There was a good display of photographs around the room, the work of members of the Photographic Convention who went to Glasgow.

After the usual technical business, a special meeting was held to ballot for a committee. The following were declared elected:—W. M. Ashman, T. Bolas, F. A. Bridge, T. J. Collins, A. Mackie, L. Medland, H. M. Smith, C. H. Trinks.

Talk in the Studio.

The "Daily News" on Patent Practice.—"The American Commissioner of Patents has determined to make a vigorous effort to reform the language of patent specifications, and by way of commencement has prohibited the further use of certain hackneyed phrases much esteemed by those who draw these documents, mainly, as it would seem, because of their vagueness. It is, perhaps, too much to hope that means will be found of introducing a similar improvement on this side of the Atlantic, where, in spite of a certain dawn of reform since the passing of Mr. Chamberlain's Act, patentees are still left very much to their own whims and fancies. If our inventors understood that vagueness, so far from helping them to cover more ground, and thus to hold their own more effectually against the ingenuity of pirates and imitators, is a perilous and an illusory protection, they would no doubt insist on specifications in language as clear as that of Cobbett himself. No doubt a certain class of patent agents find it profitable to exhibit their astuteness by thus covering as much ground as possible. As a fact there is nothing more certain to prove fatal to a patent in a court of law than a vague description or too comprehensive a claim. Very few patents have any marketable value till they have been subjected to the test of a battle in the law courts; but then it is but very few of the thousands of specifications filed every year that reach this stage. If it were otherwise both patentees and patent agents would very quickly learn that safety is only to be found in the utmost simplicity and clearness of definition."

Steel Dies from Soft Metal Originals.—The address of the company making these, given in the Photographic News last week as No. 8, should have been given as No. 39 (Princes Street, Stamford Street, Blackfriars).

The Amateur Photographic Association of Victoria.—In another column will be found some account of the successful exhibition recently held in Melbourne, by the above named Society, and we have received a copy of the invitation card which was issued for the opening note. This card is a carte size photograph of an attractive design including well-executed lettering and a landscape view taken in the colony; the credit of the production being due to J. H. Harvey, the honorary secretary. From a report and balance sheet received, we gather that the Association is in a flourishing condition.

Leisk's Sky Shutter.—(*Complete patent specification accepted*). We have received from John Leisk a series of very admirable little views of land and water scenery, taken by the aid of his sky shutter, which shutter we noticed and illustrated in our issue of last week (p. 578). In each case the sky is well represented.

Photographic Club.—The subject for discussion on September 28 will be, "Developers and Developing." Saturday outing at Dagenham; trains, Fenchurch Street, near 2 o'clock.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Albert Lawson.—1. Considering all things, we are inclined to regard the ethoxo light less safe than the blow-through jet. 2. As a general rule, it will have to be re-charged each time.

Sensitive.—The india-rubber cement sold at grindery warehouses under the name of "elastic glue" will probably prove better for the purpose. Make the pieces warm, rub on the cement, bring the surfaces into close contact, and bind the parts in position.

Wm. K. M.—It is as easy to lose money as to gain it in such an enterprise, and all depends on the soundness of your own judgment in purchasing and superintending.

J. S. T.—Thank you for the suggestion. We will write to you.

Leslie Thain.—The rapidity of the former is about one-third that of the latter. We will return your stamps, and do what you suggest.

Young Focus.—Never, as far as we know, except to give light during the operation.

L. Leisk.—It was noticed last week, and your photographs are referred to in this issue. Thank you for sending them.

J. Inskip.—Use isochromatic plates prepared according to the directions contained in the Year-Book.

C. D. de La Prade.—All the numbers you require have long since been out of print; but the back volumes can sometimes be obtained second hand by advertising for them.

W. Andrews.—There are no collected instructions on the subject, but suggestions and special directions have occasionally appeared in the Photographic News and in the Year-Books.

Chapman Jones.—Thank you; it arrived in sufficient time.

Venetia.—Even if we were intimately acquainted with your qualifications, it would be very difficult to advise; but the following may be worth consideration. If you embark your capital without having that training which enables the successful commercialist to turn circumstances to his advantage, you may find that it rapidly passes into the hands of those whose training has fitted them for business; while if, on the other hand, you obtain a situation as a worker under an employer, the fact that you have not served before is likely to be taken advantage of in fixing the rate of remuneration. As regards the special opportunities in the countries you refer to, we know nothing; but, as a general thing, a photographer has the best chance in the country he is most familiar with. We will write to you with the view of putting you in communication with a person who has had some experience of commercial photographic work in one of the districts named.

J. Johnson.—The second developer mentioned on page 195 of the current Year-Book. Washing soda is crude crystallized carbonate of soda; but, as it often contains a large proportion of the inert sulphate, it is generally well to purchase a purer article from a dealer in photographic materials or store where chemicals for commercial uses are sold. The white powder sold by druggists, grocers, oilmen, and chandlers as "carbonate of soda" is quite a different article, and will not answer your purpose.

A. J. W.—We cannot deal with the case without fuller information. All depends on the letter you refer to, and if you send the committee a photographic copy of it, and offer to produce the original when required, they can scarcely avoid taking action, and perhaps reversing their decision.

Juno.—As far as we know, such an arrangement does not exist, although suggestions have been made to construct such a machine.

Ag NO_3.—They were fined one shilling for having done that to which you refer; see p. 671 of the Photographic News for 1884.

Studio.—We think that personal application would be the best in ordinary cases.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1517.—September 30, 1887.

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THE GENESIS OF THE ELEMENTS.

As far as history gives us any account of the workings of the human mind, we find a striving after a knowledge of the beginnings of the universe—the elements of all those nomena of which we get more or less incomplete glimpses; and, according as the direction of thought has been led more in the direction commonly called spiritual, or on that side ordinarily termed material, has the sort of conception sought after by the element-seeker varied.

In the time of Aristotle it was the custom to regard the material elements as four in number—viz., air, fire, water, and earth—and our generally accepted series of sixty or seventy elements may be looked upon as in some sort a modern differentiation of the rough classification into air, fire, earth, and water.

There is a type of modern scientist whose ideas seldom go beyond the heat unit, the balance and the pendulum, who has long been content to accept matter as an ultimate and absolute existence; and in putting forth the simplest expressions of those phenomena under which matter presents itself as the elementary forms of matter, he ordinarily points out to his pupils that the number of elemental forms may be greater or less than set forth in his list; but still, like the Greek philosophers, he has some definite notion that his list is right in the main—or, at any rate, that if his list is not correct, some analogous list may really express the truth. Still, among chemists, there has been a growing notion that matter may, after all, be various more or less constant manifestations of one element, or, in other words, that some sort of continuity of properties may run through the elements of our list, and that each of the so-called elements represents, as it were, a halting-place in the range; a point at which the mind grasps pretty definitely certain properties which graduate through the whole range of the elemental matter.

One outcome of these ideas concerning matter is a paper on the Genesis of the Elements, which was published some six months ago by William Crookes, a former Editor of the Photographic News, and one who has done much towards the advance of physical science. In introducing his subject, he says :—

> At the time when our modern conception of chemistry first dawned upon the scientific mind, the average chemist as a matter of course accepted the elements as ultimate facts. He regarded his elements as absolutely simple, incapable of transmutation or decomposition, each a kind of barrier behind which we could not penetrate. If closely pressed he said that they were self-existent from all eternity, or that they had been individually created just as we now find them at the present day. Or he might argue that the origin of the elements did not in the least concern us, and was, indeed, a question lying outside the boundaries of science.
>
> But in these our times of restless inquiry we cannot help asking what are these elements, whence do they come, what is their signification? We cannot but feel that unless some approach to an answer to these questions can be found, our chemistry, after all, is something profoundly unsatisfactory. These elements perplex us in our researches, baffle us in our speculations, and haunt us in our very dreams. They stretch like an unknown sea before us—mocking, mystifying, and murmuring strange revelations and possibilities.

He then considers the various indications of unbelief in the crude doctrine expressed above as the faith of the "average chemist," and referring to the likelihood of some genetic force existing by which so-called chemical elements may be individualised out of an elemental unit; and in this connection he refers to the utterances of Dalton, Brodie Graham, Mills, Stokes, Herbert Spencer, and Milton; after these allusions Crookes says :—

> If we can show how the so-called chemical elements might have been generated, we shall be able to fill up a formidable gap in our knowledge of the universe. We have a preponderance of cumulative evidence to prove that both heavenly bodies and living organisms have been formed by evolution. We are seeking now to extend this law to the so-called elements, to the first principles of which stars and organisms alike consist.
>
> If we survey the distribution of the chemical elements we find two very distinct cases. On the one hand we see bodies grouped in definite proportions with other bodies from which they differ exceedingly, and to which they are held by affinity, more or less strong. To obtain either of two such bodies in a separate state, that affinity, as every student of chemistry knows, must be overcome. Instances of such association are too common and abundant to need mention. In such cases each of the bodies grouped together has fairly marked properties. One of them, moreover, for the most part has an atomic weight very different from that of the other.
>
> In the second case we find bodies associated with other bodies more or less closely allied to themselves. They are not held together by any decided affinity; they are not combined in definite proportions, and their atomic weights are often almost identical. If we wish to obtain one or more of these bodies in a separate state, the difficulty encountered lies not in the strength of the affinities to be overcome, but in the circumstance that whatever reagent we employ acts upon one of the substances in nearly the same manner as it does upon the other. Hence, to obtain one body of this kind entirely separate is an exceedingly tedious and difficult task. Nay, we are sometimes at a loss to decide whether we have before us a really simple body, or a mixture of bodies whose properties are almost identical.
>
> The most striking instance of such association is found in the metals of the so-called *rare earths*. These bodies form but a very trifling portion of the earth's crust. They are chiefly met grouped together in a few minerals, such as samarskite and gadolinite, which, so far, have been found in but few localities, and even in those are far from common. These earths form a group to themselves; chemically, they are so much alike that it taxes the utmost skill of the chemist to effect even a partial

separation, and their history is so obscure that we do not yet know the number of them.

In the paper before us Crookes does not consider it necessary to enter into minute details of his long series of experiments in the direction of fractionating the rare earths, but he gives such particulars as lend remarkable support to the doctrine of the continuity of matter. As an instance of this class of work, he takes especially the fractionation of the earth known as yttria—a monotonous labour which was continued "month after month, and year after year."

It seems that those constituents of the earth yttria which Crookes has separated by fractionation are almost identical in their properties, but differ slightly—"almost impercetibly," says Crookes—in their basicity. To a solution of the earth—a solution which must be very dilute—weak ammonia is added in such amount that it only precipitates one half of the bases present; and it is necessary that the dilution should be so great that a considerable time must elapse before the liquid shows any signs of turbidity. When the precipitation is complete—a circumstance involving a rest of some hours—the liquid is filtered from the precipitate. The earth precipitated is to a minute extent different from the earth retained in solution; that in solution being more basic than that thrown down. This minute difference, however, is not appreciable by chemical or physical tests until it has been made to accumulate systematically by repeated partial precipitations.

The main test of the success of the process of fractionation is the kind of spectrum given by the phosphorescent light evolved from the earth when exposed to the induction discharge in a vacuum corresponding to the reduction of the pressure of the air to about one-millionth of the normal pressure; and, under these circumstances, the different portions of the fractionated yttria give five distinct spectra, and the bodies thus more or less completely isolated are not, it must be clearly understood, mere impurities which may be removed, yttrium or samarium remaining in a pure state after their elimination. On the contrary, the molecule we formerly knew as yttrium has undergone a veritable splitting up into its constituents. But when these constituents, into which yttrium has been separated by fractionation, are submitted to the intense heat of the electric spark, the differences shown in the phosphorescent spectrum are no longer to be traced, and all five fractions show what may be called the spectrum of "old yttrium." The fractions are submitted to the intense heat of the electric spark, and, to use the words of Crookes, "the little differences of molecular arrangement vanish, and the atoms of which the molecules of yttrium, Gα and Gβ are alike composed, reveal their presence in identical spectra."

The lesson learned is thus stated by the author of the paper:—

> Our notions of a chemical element have expanded. Hitherto the molecule has been regarded as an aggregate of two or more atoms, and no account has been taken of the architectural design on which these atoms have been joined. We may consider that the structure of a chemical element is more complicated than has hitherto been supposed. Between the molecules we are accustomed to deal with in chemical reactions and ultimate atoms as first created, come smaller molecules and aggregates of physical atoms; these sub-molecules differ one from the other, according to the position they occupied in the yttrium edifice.
>
> Perhaps the hypothesis can be simplified if we imagine yttrium to be represented by a five-shilling piece. By chemical fractionation I have divided it into five separate shillings, and find that these shillings are not counterparts, but, like the carbon atoms in the benzol ring, have the impress of their position, 1, 2, 3, 4, 5, stamped on them. These are the analogues of my Gα, Gβ, &c. If I now bring in a much more powerful and searching agent—if I throw my shillings into the melting-pot or dissolve them chemically—the mint stamp disappears, and they all turn out to be silver. I submit my yttrium, or my Gα, Gβ, &c., to the intense heat of the electric spark, the little differences of molecule arrangements vanish, and the atoms of which the molecules of yttrium, Gα and Gβ are alike composed reveal their presence in identical spectra.

It is difficult to conjecture in what direction the experiments of Crookes will lead us—experiments which strike at the root of the idea of the constancy of the so-called elemental forms, research which probably will before long be repeated in many forms; and it is not unlikely that the photographic behaviour of bodies may give us a test for differentiation as satisfactory as the test by the phosphorescent spectrum.

It would be interesting to consider the above-mentioned investigations by the light of the theory of the Universe which regards matter as only existing subjective to mind, but a lengthened enquiry of such a nature would be out of place in our columns; indeed, in recording investigations likely to bear closely on the photographic work of the future, we have in the main used the language and taken the ground of the vast majority who accept—although, perhaps, with some protest—the objective view of the material universe.

GRAIN IN PHOTO-TYPOGRAPHIC BLOCKS.

In a recent work called *Reproductions-Photographie*, and which book has been recently reviewed in the News, there are numerous details regarding the methods of preparing and using grain plates or negatives in order to break up the half-tone of the photograph, so as to obtain a stipple adapting it for working by the typographic method or by lithography.

The old idea of placing a network between the half-tone negative and the photo-lithographic paper on which the transfer is made, and thus breaking up the tone, is one which has been modified in several ways of late. The term network must be taken in a very wide sense, and includes film negatives obtained by photographic and mechanical processes from originals of various kinds; one of the simplest ways of getting such a network film being to photograph a sheet of paper or cardboard which has been ruled with closely and regularly-spaced cross-lines, and to strip the film from the negative thus obtained; while another method is to work a grain on a lithographic stone, and to make a vigorous impression of this upon thin or translucent paper.

Another method of obtaining a grained film for the above mentioned purpose is to rub printer's ink over a ground glass plate, and then to wipe off the excess as in the case of an ordinary intaglio printing plate, after which the plate is levelled and flooded with a warm solution of gelatine. When this gelatine is dry it is stripped off, and carrying the printer's ink with it forms a grain pellicle which breaks up the half-tone image in a very pleasing manner.

All granulating films of the kind referred to are rather difficult to deal with, as moisture and other conditions cause them to lose their flatness, and then it becomes difficult to obtain perfect contact with both the negative and the transfer paper. Under such circumstances, the granulations are not impressed sharply on the transfer paper, the result being that several granulations run together, and a black patch results on the lithographic stone.

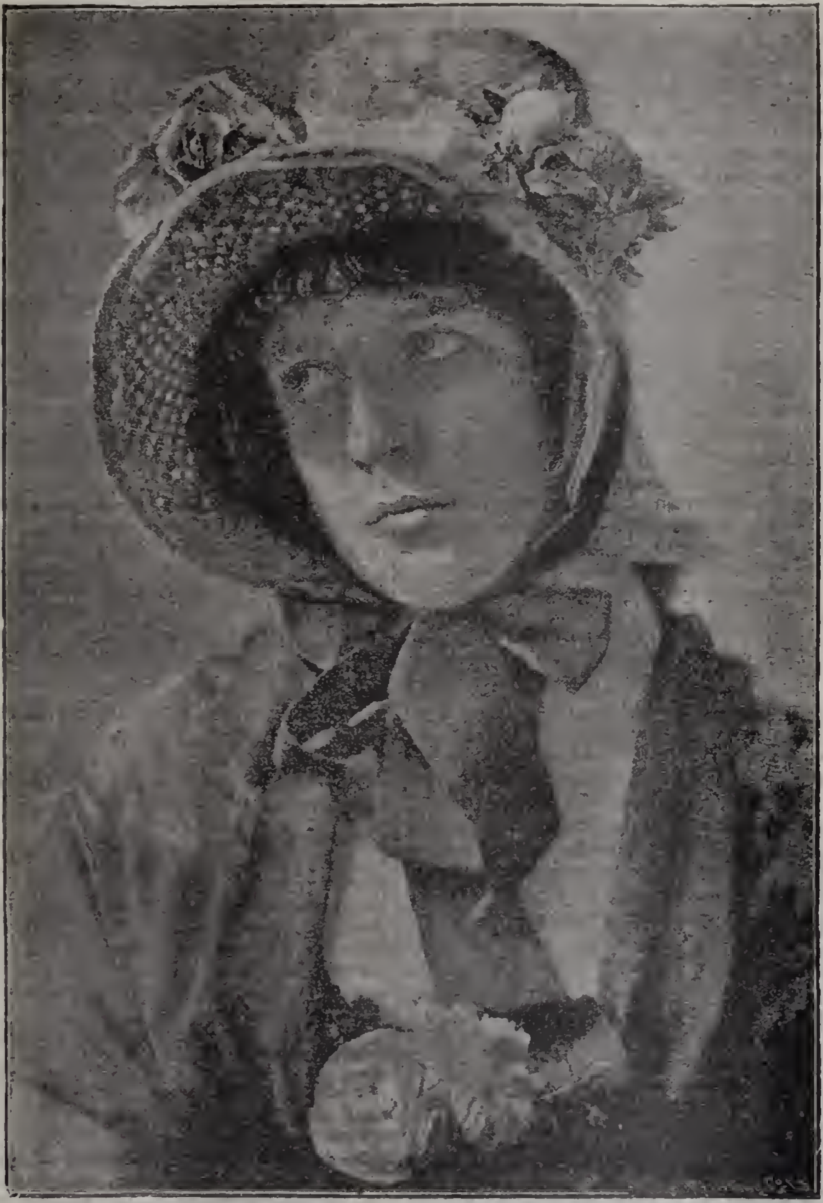
A finely-woven gauze stretched on a frame was found to be fairly satisfactory, excepting as far as its texture was found to be uneven: threads of unequal diameter occurring here and there, and consequently damaging the result.

Meisenbach, in 1883, demonstrated the advantages of working in a somewhat different fashion, namely, by interposing a lined plate or negative between the sensitive plate and the original to be photographed; and some details of Meisenbach's method of working will be found in his specification already published in the Photographic News.

Husnik has simplified the method, and gives the following particulars:—

In the first place a series of clean parallel lines are engraved upon a polished lithographic stone, it being necessary to use a diamond point and a good ruling machine, and the lines should be so close together that there are about a hundred or a hundred and thirty to an inch. The stone thus prepared is got ready for printing in the usual way, and impressions are taken upon dull surfaced enamel paper. One of the impressions is then photographed, either on the same scale or slightly reduced, but two negatives are made; one with lines corresponding to the long way of the plate, and the other with the lines corresponding to the narrow way of the plate.

The photograph to be copied is now focussed, and one of the line negatives is interposed between the objective and the sensitive plate, and, indeed, quite close to the latter. About half the exposure is now given, after which, the lined plate in front of the sensitive surface is replaced by that lined plate on which the ruling is in the contrary direction, and the remainder of the exposure is given. On development there is obtained a negative on which the gradations of the original are fairly translated into a network grain, and which negative yields by the photo-lithographic transfer process, by the asphalt process, or by the albumen process, a relief block having all the good printing qualities of the best commercial work.



REPRODUCTION OF BLOCK BY HUSNIK'S PROCESS.

In Husnik's book is an illustration printed from a block made from a grain negative by this process, and we have had this illustration reproduced by the ordinary method. It has suffered somewhat in reproduction, but gives a good idea of the value of the process.

BOMBAY AMATEUR PHOTOGRAPHIC SOCIETY.

A correspondent from Bombay, assuming that our readers may not have heard of the existence of an amateur photographic society in that place, sends us an account of a successful exhibition of members' work on the 24th and 25th ult., as given in the *Times of India*. As the report gives also a short history of the Society, we subjoin an extract bearing upon it.

Only about a year ago the Bombay Amateur Photographic Society was formed, and it proves its great vitality by already being in a position to hold an exhibition. The society owes its existence to two or three members, who, thinking that Bombay might contain a number of amateur photographers, came upon the idea to form a society, and with a view to ascertain what support such an undertaking would get, called for a meeting of amateur photographers at the Sassoon Mechanics' Institute, which at once proved that such a society was much needed to bring amateur photographers together for mutual help as well as for encouragement, and the project was at once adopted, and has proved a success. There can be no doubt that a society of this kind is a great help to individual workers, as one member can give account of his experiences to the other members; any new process can be tried by some members, and the result communicated to the rest of the members; any difficulties experienced might be brought forward, and with joint effort overcome. For a hundred other reasons we can well understand the advantage to amateurs of having such a society, and not the least reason would be sympathy and companionship in one's studies. Most amateur fads soon die out when the novelty is exhausted, unless the amateur finds some kindred spirits to consult or work with or recount his successes or failures to, and so get fresh incentive for renewed exertions, for every field of labour has difficulties and failures in store for the beginner, and one must be willing to overcome these before one can taste of the sweet of success.

Of the exhibition held at the Framjee Cowasjee Institute on the dates named, the same paper remarks:—

The exhibition clearly proves the need there was for such a society, as over three hundred photographs are being shown by members of the society only; and if photographs had been accepted from other amateurs, the Framjee Cowasjee Institute Hall would not have sufficed for the display. The photographs exhibited are wonderfully good for amateur work. They are all good, and we look in vain for the usual blotched and blurred photograph of the tyro. We fail to see the leaden sky and the fogged plate, or the large photograph taken with a lens that would only cover half the size, and so left all but the centre to be guessed at; nor do we find the spots and pinholes usually associated with amateur work. These photographs are all well-finished, and look quite artistic and business-like.

Anticipating the dissatisfaction with decisions of the judges that is characteristic of all exhibitions at which prizes are given, the writer of the report continues:—

There will, no doubt, be some heartburnings and disappointment felt with the decision of the judges, but amongst such a number of photographs, nearly all of which are of the same merit, it was difficult to pick out the ones that should have the prizes. In an exhibition where a few photographs are decidedly superior to the rest, the awarding of prizes becomes an easy matter; but where the photographs are all of about the same quality it becomes a matter of hard work and minute comparison to decide upon the superior merit. The judges in this case have taken the greatest trouble to come to a decision, and have awarded the prizes after very careful comparison and consultation, and as they in no case were made acquainted with the names of the exhibitors, they could not have been partial, and if they have made any mistake of judgment, it is solely due to the great number of photographs, all of equal quality, which they had to select from. Those exhibitors who have not been fortunate enough to obtain a prize will bear in mind that all could not get prizes, and it will be a solatium to them to know that their photographs made a very respectable appearance in the exhibition, and next time they may carry off the prize which this time was obtained by a confrère, and what a friend gets cannot be counted a loss.

The photographs, it appears, of which there was not a single specimen of enamelled portraiture, were nearly all by the silver process. The *conversazione* held at the Institute by the members of the Society is described as a bright little affair, well attended despite inclement weather. Dr. William Gray (president) asked the gathering not to criticise too hardly the work of a first exhibition, and recommended all who were not photographers to take to the art at once, as opening out a new world of pleasure.

The prizes awarded comprised a gold medal for best set of views, won by G. Ewing; a silver medal for best set of views, of which the president (Dr. Gray) was the recipient, as he was also of the prize for the best figure study, Dr. Hojel being highly commended; an award to E. F. Nicholson of a bronze medal; a prize to G. Briethaupt for the best portrait; and one to H. Bromley for amateurs of less than one year's standing.

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THE SUN'S HEAT.

BY SIR WILLIAM THOMSON, LL.D. F.R.S. M.R.I.[*]

Professor of Natural Philosophy in the University of Glasgow.

We supposed the two globes to have been at rest when they were let fall from a mutual distance equal to the diameter of the earth's orbit. Suppose, now, that instead of having been at rest they had been moving in opposite directions with a velocity of two (more exactly 1·89) metres per second. The moment of momentum of these motions round an axis through the centre of gravity of the two globes perpendicular to their lines of motion is just equal to the moment of momentum of the sun's rotation round his axis. It is an elementary and easily proved law of dynamics that no mutual action between parts of a group of bodies, or of a single body, rigid, flexible, or fluid, can alter the moment of momentum of the whole. The transverse velocity in the case we are now supposing is so small that none of the main features of the collision and of the wild oscillations following it, which we have been considering, or of the magnitude' heat, and brightness of the resulting star, will be sensibly altered; but now, instead of being rotationless, it will be revolving once round in twenty-five days and in all respects like to our sun.

If instead of being at rest initially, or moving with the small transverse velocities we have been considering, each globe had a transverse velocity of three-quarters (or anything more than ·71) of a kilometer per second, they would just escape collision, and would revolve in ellipses round the centre of inertia in a period of one year, just grazing other's surface every time they came to the nearest points of their orbits.

If the initial transverse velocity of each globe be less than, but not much less than, ·71 of a kilometer per second, there will be a violent grazing collision, and two bright suns, solid globes bathed in flaming fluid, will come into existence in the course of a few hours, and will commence revolving round their common centre of inertia in long elliptic orbits in a period of a little less than a year. Tidal interaction between them will diminish the eccentricities of their orbits, and if continued long enough will cause the two to revolve in circular orbits round their centre of inertia with a distance between their surfaces equal to 6.44 diameters of each. Suppose now, still choosing a particular case to fix the ideas, that twenty-nine million cold solid globes, each of about the same mass as the moon, and amounting in all to a total mass equal to the sun's, are scattered as uniformly as possible on a spherical surface of radius equal to one hundred tines the radius of the earth's orbit, and that they are left absolutely at rest in that position. They will all commence falling towards the centre of the sphere, and will meet there in two hundred and fifty years, and every one of the twenty-nine million globes will then, in the course of half an hour, be melted, and raised to a temperature of a few hundred thousand or a million degrees Centigrade. The fluid mass thus formed will, by this prodigious heat, be exploded outwards in vapour or gas all round. Its boundary will reach to a distance considerably less than one hundred times the radius of the earth's orbit on first flying out to its extreme limit. A diminishing series of out and in oscillations will follow, and the incandescent globe thus contracting and expanding alternately, in the course it may be of three or four hundred years, will settle to a radius of forty[†] times the radius of the earth's orbit. The average density of the gaseous nebula thus formed would be

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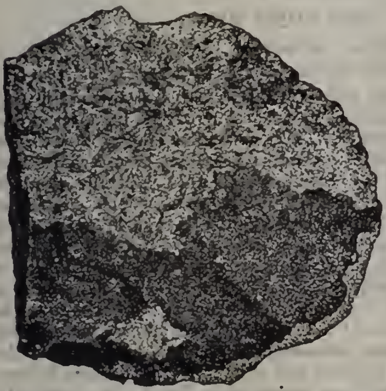
[*] Continued from page 590.

[†] The radius of a steady globular gaseous nebula of any homogeneous gas is 40 per cent of the radius of the spherical surface from which its ingredients must fall to their actual positions in the nebula to have the same kinetic energy as the nebula has.

(215 × 40)$^{-3}$, or one six hundred and thirty-six thousand millionth of the sun's mean density; or one four hundred and fifty-four thousand millionth of the density of water; or one five hundred and seventy millionth of that of common air at an ordinary temperature of 10° C. The density in its central regions sensibly uniform through several million kilometers, is one twenty thousand millionth of that of water; or one twenty-five millionth of that of air. This exceedingly small density is nearly six times the density of the oxygen and nitrogen left in some of the receivers exhausted by Bottomley in his experimental measurements of the amount of heat emitted by pure radiation from highly heated bodies. If the substance were oxygen, or nitrogen, or other gas or mixture of gases simple or compound, of specific density equal to the specific density of our air, the central temperature would be 51,200° Cent., and the average translational velocity of the molecules 6·66 kilometers per second, being $\sqrt{\frac{3}{7}}$ of 10.2, the velocity acquired by a heavy body falling unresisted from the outer boundary (of 40 times the radius of the earth's orbit) to the centre of the nebulous mass.

The gaseous nebular thus constituted would in the course of a few million years, by constantly radiating out heat, shrink to the size of our present sun, when it would have exactly the samo heating and lighting efficiency. But no motion of rotation.

Fig. 1.



5 centimetres.

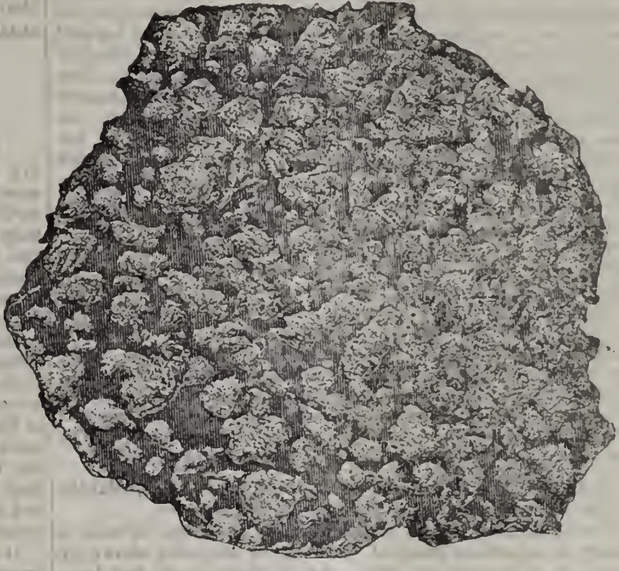
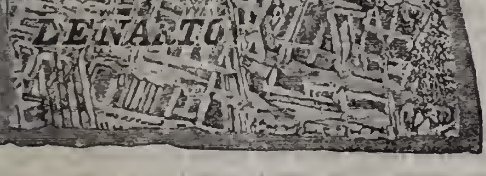


Fig. 2.—13½ centimetres.

Tho moment of momentum of the whole solar system is about eighteen times that of the sun's rotation; seventeen-eighteenths being Jupiter's and one-eighteenth the Sun's, the other bodies being not worth taking into account in the reckoning of moment of momentum.

Fig. 3.



9¼ centimetres.

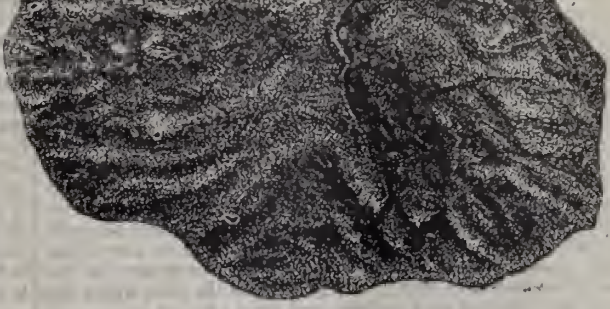


Fig. 4.—15 centimetres.

Now instead of being absolutely at rest in the beginning, let the twenty-nine million moons be given each with some small motion, making up in all an amount of moment of momentum about a certain axis, equal to the moment of momentum of the solar system which we have just been considering; or considerably greater than this, to allow for effect of resisting medium. They will fall together for two hundred and fifty years, and though not meeting precisely in the centre as in the first supposed case of no primitive motion, they will, two hundred and fifty years from the beginning, be so crowded together that there will be myriads of collisions, and almost every one of the twenty-nine million globes will be melted and driven into vapour by the heat of these collisions. The vapour or gas thus generated will fly outwards, and after several hundreds or thousands of years of outward and inward oscillatory motion, may settle into an oblate rotating nebula extending its equatorial radius far beyond the orbit of Neptune, and with moment of momentum equal to or exceeding the moment of momentum of the solar system. This is just the beginning postulated by Laplace for his nebular theory of the evolution of the solar system; which, founded on the natural history of the stellar universe, as observed by the elder Herschell, and completed in details by the profound dynamical judgment and imaginative genius of Laplace, seems converted by thermodynamics into a necessary truth, if we make no other uncertain assumption than that the materials at present constituting the dead matter of the solar system have existed under the laws of dead matter for a hundred million years. Thus there may in reality be nothing more of mystery or of difficulty in the automatic progress of the solar system from cold matter diffused through space, to its present manifest order and beauty, lighted and warmed by its brilliant sun, that there is in the winding up of a clock* and letting it go till it stops. I need scarcely say that the beginning and the maintenance of life on the earth is absolutely and infinitely beyond the range of all sound speculation in dynamical science. The only contribution of dynamics to theoretical biology is absolute negation of automatic commencement or automatic maintenance of life.

I shall only say in conclusion:—Assuming the sun's mass to be composed of materials which were far asunder before it was hot, the immediate antecedent to its incandescence must have been either two bodies with details differing only in proportions and densities from the cases we have been now considering as examples; or it must have been some number more than two—some finite number—at the most the number of atoms in the sun's present mass, a finite number (which may probably enough be something between 4×10^{57} and 140×10^{57}) as easily understood and imagined as number 4 or 140. The immediate antecedent to incandescence may have been the whole constituents in the extreme condition of subdivision—that is to say, in the condition of separate atoms; or it may have been any smaller number of groups of atoms making minute crystals or groups of crystals—snowflakes of matter, as it were; or it may have been lumps of matter like a macadamising stone; or like this stone† (Fig. 1), which you might mistake for a macadamising stone, and which was actually travelling through space till it fell on the earth at Possil, in the neighbourhood of Glasgow, on April 5, 1804; or like that* (Fig. 2) which was found in the Desert of Atacama, in South America, and is believed to have fallen there from the sky—a fragment made up of iron and stone, which looks as if it has solidified from a mixture of gravel and melted iron in a place where there was very little of heaviness; or this splendidly crystallised piece of iron (Fig. 3), a slab cut out of the celebrated aerolite which fell at Lenarto, in Hungary; or this wonderfully-shaped specimen (of which two views are given in Figs. 4 and 5), a model of the Middlesburgh meteorite (kindly given me by Professor A. S. Herschel), having corrugations showing how its melted matter has been scoured off from the front part of its surface in its final rush through the earth's atmosphere when it was seen to fall on March 14, 1881, at 3 35 p.m.

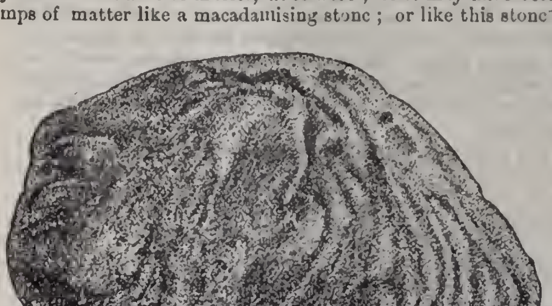


Fig. 5.

For the theory of the sun it is indifferent which of these varieties of configurations of matter may have been the immediate antecedent of his incandescence, but I can never think of these material antecedents without remembering a question put to me thirty years ago by the late Bishop Ewing, Bishop of Argyll and the Isles: "Do you imagine that piece of matter to have been as it is from the beginning; to have been created as it is, or to have been as it is through all time till it fell on the earth? I had told him that I believed the sun to be built up of meteoric stones, but he would not be satisfied till he knew or could imagine, what kind of stones. I could not but agree with him in feeling it impossible to imagine that any one of such meteorites as those now before you has been as it is through all time, or that the materials of the sun were like this for all time before they came together and became hot. Surely this stone has an eventful history, but I shall not tax your patience by trying just now to trace it conjecturally. I shall only say that we cannot but agree with the common opinion which regards meteorites as fragments broken from larger masses, and we cannot be satisfied without trying to imagine what were the antecedents of those masses.

* * *

BUSINESS MANAGEMENT.

BY CRITICUS.*

No. IX.

Although we attach a good deal of importance to the suggestion made in our last of successfully re-introducing the "Victoria" as a means of imparting renewed energy to portraiture business in general, and believing, as we do, that if photographers agree to take common action in this respect, therein lies the possibility of a lengthened reign of popularity, as great, or even greater, than that which followed the introduction of the "Carte"; still, photographs of more pretentious dimensions must not be neglected, but fostered whenever opportunity occurs. The demand for large photographs varies much more than might be expected, both as regards particular neighbourhoods and countries. Good direct portraits on 12-inch plates, and larger, receive a far greater degree of patronage in America and some parts of Germany than they appear to do elsewhere. For upwards of a quarter of a century, fifteen, eighteen, and twenty-inch plates have been in use by a few of the leading houses in this country, but the number of orders has never, so far as we can ascertain, reached a high percentage of the general work. The reason for this is not apparent, as the greater cost of production, arrangements for re-sittings when an unsatisfactory expression or position results, or the vague suspicion that the more expensive photograph will ultimately fade, applies with equal force everywhere. The late Robert Crawshay, of Cyfarthfa Castle, the great Welsh ironmaster, fully recognized the importance of large heads taken direct in the camera, and it will be within the recollection of many that in order to promote a more general practice of this class of work, he gave in the years 1873 and 1874 money prizes amounting to nearly £200. The competitors exhibited their results through the agency of the Photographic Society of Great Britain,† at the Pall Mall Gallery, in the first-named year, and at Suffolk Street upon the second occasion. Those who remember the displays will probably agree with us, that with one or two exceptions the heads shown were not of such a nature as to attract public notice in a favourable manner; but it must be admitted that portraiture of this class, in those days, by the wet collodion process, and by means of rapid dry plates to-day, with all the advantages derivable therefrom, are two distinctly different things.

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* Even in this, and all the properties of matter which it involves, there is enough, and more than enough, of mystery to our limited understanding. A watch-spring is much farther beyond our understanding than is a gaseous nebula.

† These three meteorites are in possession of the Hunterian Museum of the University of Glasgow, and the woodcuts, Figs. 1, 2, and 3, have been executed from the actual specimens kindly lent for that purpose by the keeper of the museum, Professor Young. The specimen represented by Fig 1 is contained in the Hunterian collection, that by Fig. 2 in the Eck collection, and that by Fig. 3 in the Lanfine collection—the scale of dimensions is shown for each. It may be remarked that Fig. 2 represents a section of the meteorite taken in the plane of the longest rectangular axes; the bright markings being large and well-formed crystals of olivine, embedded in a matrix of iron. In Fig. 3 is depicted the beautiful Widmanstatten marking characteristic of all meteoric iron, and so well shown in the well-known Lenarto meteorite.

* Continued from page 408.

† At that time known as the London Photographic Society.

Since the events just alluded to, more attention has been devoted to enlarging, and we think in some measure this was initiated, if not due, to the special prizes given by Robert Crawshay for improvements in this direction. The carbon or pigmented gelatine process has done excellent service, not only by raising the standard of quality in large work, but also by conferring certain advantages in the way of colour of image and permanency. We know of nothing which gives more importance to a photographer's show-room than the display of a choice selection of autotype enlargements suitably mounted and framed. The teak frames supplied by the Company answer these conditions admirably, and the result as a whole harmonizes perfectly with the everyday productions of a good class establishment. They also form a most excellent base for oil and water colour finishing, from the fact that they are unalterable. In such company we should not like to place examples of badly painted collodion transfers in Dutch metal frames of Alhambra type, a dozen of which latter may be bought for five and twenty to thirty shillings, for we are perfectly satisfied that Cheap Jack photography is not synonymous with good taste and judgment; nor is it in the interest of photographers to mix it with work of superior character. Although the carbon process may with fairness be said to hold its own against all comers, other and cheaper methods are equally valuable. These may be used in illustrating the capabilities of our wondrous art; and we suggest that as many as possible of the different methods by which attractive photographs can be produced be represented by well chosen examples, those which receive the highest eulogiums being noted, with a view to push their merits in every legitimate manner, and thereby enable each photographer to distinguish himself by the issue of a specialité, which has at least some pretensions to success surrounding it.

The bromide process has now reached a state of high perfection, and the manipulations are so simple that it can be worked at a very moderate cost, together with certainty. Moreover, it yields attractive results, and has undoubtedly benefitted the whole photographic world. With its many advantages we are afraid that it may also be made to present disadvantages in the respect of cheapening to an absurdly low rate the ordinary charges for reproductions. Of course conscientious men would hesitate before accepting commissions which failed to show a fair prospective remuneration over the cost of production. On the other hand, there are others who act less wisely, and curtail the margin of profit on enlargements until the price realised does not leave anything to pay for artistic working up, which they all need more or less. The outcome of this policy is just what might reasonably be expected, viz., that those clients who are not devoid of taste feel dissatisfied when the work is sent home, and if a monetary dispute does not follow, they at all events refrain from having other work of this class executed. The error of cheapness has been oft committed, especially by the issue of coloured collodion transfers at very low rates, and every photographer of long experience is aware of the harm which has thus been wrought; we therefore express an earnest desire that our readers who may be entertaining the notion of forcing the trade in bromide enlargements will devote their energies to improving the work rather than cheapening prices, and we are quite sure that the few customers they may lose in consequence will not be missed.

An effective photograph, and one which makes an excellent specialité, is a softly graduated vignette upon opal glass or porcelain, irrespective of the process by which it is produced, always provided that it has been carefully prepared. Of late the bromide process has become popular for making opal pictures, and in many instances that have come under our notice, the conditions of careful manipulation have not been very generally fulfilled. The truth of this statement may be verified by anyone who will take the trouble to examine specimens of the work referred to in show-cases of photographers situated along several London thoroughfares. No doubt these opaltypes were produced by the bromide process, and either from insufficient washing, or fixing, or both, a compound has been formed in the gelatine used to support the image, which compound has undoubtedly been acted upon by light, with the result that the margins, which should appear pearly white, are now represented by several degrees of discolouration, ranging from a pale tint to that of deep yellow. There can be no manner of doubt concerning the effect these dejected looking specimens of photography produce upon public opinion, and the sooner they are replaced by others less distasteful to the observant passer-by, the better for the reputation of those particular establishments.

Owing to the demand which has pretty generally sprung up for portraits and views upon opal, a brisk trade has also grown in plush frames, which have proved to be a convenient and suitable method of mounting these, in many cases, beautiful examples of photography. We often wonder, therefore, why photographers do not keep a choice assortment of the newest styles and patterns of frames in stock, so that they can be introduced to the notice of customers whenever a favourable opportunity occurs. In order to do this satisfactorily, it would become necessary to offer such goods at prices similar to those of other traders in frames, or the stock might probably hang on hand a long time, become old-fashioned, dingy, and unsaleable, finally proving more troublesome than desirable. At one time photographers had the trade of fancy frames, suited to the sizes of their pictures, to a great extent in their own hands; but this condition of things cannot be claimed any longer. It has gone into other channels where competition is very much keener, and where it is the custom to add a small percentage profit on the wholesale cost of the articles, which sum forms the retail selling price. The trader appears satisfied with the result which accrues, and the public, who derive a distinct advantage by the scheme, have certainly no less cause to appreciate it.

In the next and concluding article we intend to make some remarks upon publishing photographs, and resume the subject already touched upon of commercial production in quantity.

(*To be continued.*)

Notes.

In this age of cheap and abundant illustration, politics by pictures is likely to become a prominent feature in party warfare. Photographs are only available in a few instances, as it is not often they will lend themselves to the greater or less degree of exaggeration that the politician and the stump orator desire.

Both the Radical party and the Tory party are said to be preparing series for the magic lantern, to be used during the coming winter season; the slides of the former being intended to illustrate the horrors of the Irish evictions, and the evil deeds of the existing authorities, while the Conservative series will show the sufferings of those who suffer by the boycott, the results of the machinations of the dynamiter, and bandaged and bruised police who have had practical acquaintance with the blackthorn.

Just now the state of tension in Western Europe makes it advisable for the amateur photographer to be especially careful to avoid the appearance of photographing forts, or other military works, and as an illustration we may quote from a letter by Edward Husband, of St. Michael's, Folkstone, which was published in the *Standard* on Wednesday last.

Mr. Husband says :—" A few weeks ago I went to Calais for the purpose of photographing the mail steamer entering the harbour. I took up my position at the sea end of the pier, with the lens of my camera directed seawards, the forts being far behind me. At last an official came up and said to me, 'I have been watching you, and it is my duty to arrest any one found photographing here; but,' he said, 'as I see that you have only photographed in the direction of the sea, and not towards the forts, I will let you off this time.' Afterwards I wrote to the Mayor of Calais, and asked his permission to photograph the incoming steamer, at the same time promising not to photograph in the direction of the forts; but my request was peremptorily refused."

Looking at the matter *purely from a military point of view*, it may be contended that the authorities were right. It is not generally known that the naval authorities of every European country pay large premiums for good photographs of the war ships and forts of other powers. These photographs are enlarged when enlarging is considered to make them clearer to the unassisted eye, made up at considerable expense into albums, and served out to the naval commanders. Not long ago we saw the photographic albums belonging to one of our ironclads, and we were certainly surprised to find the war-ships and forts of other nations so well represented.

It must also be remembered that a secret agent wishing to photograph a foreign fort would, if he took a camera undisguised, naturally turn his camera away from the fort if he understood his business; but either he would have a reflecting prism in his main lens tube, or the real working lens would be at the side of the camera, and the reflecting prism inside.

Another attempt has been made to solve the problem, "Who buys the photographs of actors?" We are told by the *Court Journal* that some people have a mania for forming theatrical scrap-books. Programmes, paragraphs relating to the piece, criticisms, and any photographs or pictures which can be procured, are carefully preserved, and hence the portraits of the actors, as well as those of the actresses, are purchased. There are, probably, individuals who make this kind of thing their hobby, but we fancy they are few and far between. Certainly they are not sufficiently numerous to make it worth while for either photographer or actor to rely upon them alone for a market. The answer to the question has yet to be found.

For the old saying, "When in doubt play a trump," the modern equivalent would certainly seem to be, "In all cases of probable doubt or difficulty, take a photograph." Once more in the case of the most recent frontier incident at Raon-sur-Plaine, the French Procurator-General has initiated his enquiry into the lamentable circumstances of the tragedy by promptly performing, or causing to be performed, that operation. We read in the daily paper, that "M. Sadoul, on arriving on the spot, at once commenced his enquiry by having a photograph taken of the officers dressed in the shooting suits in which they were, it is said, mistaken for poachers by the German *gendarme*." And in the original Schnabélé case, it will be remembered, the settlement ultimately arrived at turned to a great extent on the comparison of photographs taken of the scene of the incident by the French and German authorities. Again, to take another modern application of photography, the ruins of Whiteley's Westbourne Grove establishment were photographed before a stone or brick was removed; and the railway authorities concerned in the Hexthorpe accident were careful to secure good negatives of the wrecked train before an attempt was made to clear the line. And we need scarcely say how very useful an instantaneous photograph of the square at Mitchelstown, at the moment the constabulary began to fire, would be, could it be produced in the enquiries now pending. It would serve, perhaps, to reconcile versions of the affair which at present seem hopelessly at variance. In future, we would advise the Chief Secretary to send a Government photographer, as well as a Government reporter, to every proclaimed meeting; whilst the Nationalists, on the other hand, will surely be able to find some ardent patriot with the necessary will, and camera, to photograph on behalf on the League in every district.

Those peripatetic photographers who work on the sands of the cheap watering-place are not, as a rule, inclined to stand very stoutly on their rights, we fear. Possibly a long experience of the tyranny of Local Boards—to say nothing of the outspoken criticisms of 'Arry and 'Arriett—have led them to believe that they have no rights, or, at all events, none worth standing up stoutly for. Be this as it may, we noticed an incident the other day at a popular watering-place, which shall be nameless, from which it would seem that the seaside photographer has not always the spirit to insist on his rights, even if he imagines he possesses any. The sands of the place we refer to were much overrun by *al fresco* entertainers of various kinds, and at last it seemed that the rival niggers, and conjurors, and "Davenport brothers," &c., had brought about such a chaotic state of affairs by their efforts to gain the public patronage, that the local authority had interfered, and insisted on the drawing up a time table for the guidance of the said miscellaneous entertainers. Each party, that is to say, whether niggers, performing dogs, German band, open-air wizard, or what not, had to appear in succession for a fixed time. So far, so good; but what seemed to be scarcely fair or considerate was the fact that the "beach photographers" were also classed with the showmen, &c., and included in the "time tables." Each of them had, in fact, to take his turn, and had no longer allowed time for that turn than the young man who played on the penny whistle with his nose, or that other performer who had come all the way from Patagonia, as he told us, to show us how the native Indians were in the habit of supping off flaming tow. And what is more, the two melancholy men who were subjected to this arbitrary ruling accepted it with sad resignation. In fact, all independence seemed to have been crushed out of them, possibly by the badness of trade, and we found it impossible to persuade them to even attempt a protest. What significance there is in their tame submission we need hardly point out. If this is what beach photography is coming to, surely it will be soon played out altogether.

A correspondent writes :—“ In reading your comment on the club system of photography a fortnight ago, it occurred to me that you had overlooked one drawback in the system which I have noticed from my own experience. I am not a professional photographer, and before I dabbled in the art as an amateur I was persuaded to join a club. It was conducted on the plan of a Star Bowkett Building Society ; that is to say, there were ballots every week, and the lucky winner of a “draw” might go at once and have his portrait taken, though he had paid but one subscription. I suppose I was unlucky, for I had been in the club a year before my turn came. However, when it did come, I started off to the photographer, expecting all my troubles were at an end. I made a mistake, for it was nearly two months before I got a proof from the photographer, and about six months before he completed the order, which comprised a tinted “club” picture, and a dozen cartes. I was not the only one who had this experience, and the conclusion I and some of my fellow members came to was, that the club photographer took not the slightest interest in his work, and that we were always pushed on one side for the ordinary ready-money customer. Nothing would induce me to join a club again, and my advice to the local man is to do the very best work, and *execute it properly*. I believe many photographers come to grief because they are so slow in sending proofs, and in finishing the order when they have got it. Anyone who has his portrait taken is in a fever of impatience for the first three days to see how he looks, and if he is pleased, while the fit is on him will order double the quantity he would if his mood is allowed to pass away. I can't see why the local man should be afraid of the club system, if he attends to the two important conditions I have mentioned.

J. C. Robinson, who has for many months past been pertinaciously sounding a note of alarm as to the injurious action of light on the water colour drawings at South Kensington, is much dissatisfied at the answer given to Sir Algernon Borthwick, in the House of Commons, to the effect that the committee entrusted with the question will not be able to make a report for several months. Mr. Robinson may have cause to be dissatisfied, but we do not see in what way the report of the committee, whatever may be the conclusions they arrive at, can affect the exhibition of water colours drawings. The committee may definitely condemn the use of certain pigments, but we presume they will not under any circumstances recommend the placing of water colour pictures in portfolios. If the public is to be debarred from looking at water colours simply because the light of an ordinary gallery affects them, then they may as well not have been painted, because no one will take the trouble to search through ponderous portfolios, or the folding screens such as hold the Mulready studies at the South Kensington.

A correspondent of the *Athenæum* calls attention to the encouragement given to photo-engraving by the Print Sellers' Association, which consents to stamp the proof of photogravures, “and therefore acknowledges that they are works of art on the same level as actual engravings.” We are inclined to agree with the complainant as to the absurdity of stamping a photogravure, but not for the reason alleged. A stamp on an engraving is not the slightest guarantee that the picture is a work of art. It simply is a register of the condition of the plate at the time the proof was pulled. A photogravure may be a work of art “on the same level” as an “actual engraving,” and the stamp on it is simply a farce, because the wear and tear of the plate are not at all analogous to that which the engraved plate undergoes, and can, if it experiences any deterioration, be easily replaced. We are inclined to think the object of stamping a photogravure is to put a factitious value upon it. The stamping can certainly answer no other purpose.

The correspondent gives some interesting figures as to the increasing sale of photogravures, which are worth quoting. In 1879, out of a total of 65 engravings declared by the Association, only 5, or one-thirteenth, were photo-engravings ; whereas, in 1885, out of a total of 153 prints declared, 49 were photo-engravings, or about one-third of the whole ; and in 1886, out of 146 prints declared, 33 were photo-engravings, or about one-fourth of the whole. But for the burst of popularity which etching has undergone during the last seven years, the proportion would have been larger still.

A complete series of the photographs of Old London will soon become a rarity. Mr. Alfred Marks announces that the subscription list of the Society having been kept open for more than a year on the terms mentioned in the circular last issued, it has now been determined to discontinue printing from the negatives. Out of the small stock remaining in the photographers' hands, a very few complete sets of the entire issue have been made up, and subscriptions will be received for these complete series, and for such single sets only as are left over, till their exhaustion, when all publication will cease. This limitation will of course add to the value of the prints ; but we would like to know what will become of the negatives. Are they to be destroyed, like the plates of valuable engravings, or are they, as we hope, to be preserved ? Unless the prints new issued are in carbon or platinotype, they will show signs of fading or discolouration sooner or later. Certainly, in another quarter of a century, the owners who value such records would like to have their prints renewed. Some statement as to what is to be done with the negatives would certainly be interesting.

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HYDROCHINON AS A DEVELOPER FOR DRY PLATES.

BY E. C. VON SOTHERN.*

The various possible, and, alas! oftentimes also nearly impossible forms of developer which, from the first practical application of the gelatine dry-plate process up to the present day, have from time to time been brought forward, would fill many a page of photographic literature, and upon the experimental photographer has devolved the task of learning, from careful and practical tests, the characteristic qualities of each individual formula, of determining the amount of advantage gained from applying the one or the other, simple or modified, to certain special purposes, and of deducing therefrom the relative value as to general or special usefulness of the many different mixtures and components.

His work, though highly interesting, has been arduous and difficult. Many a golden kernel of wheat has been brought to light out of an abundance of worthless chaff, and too much praise cannot be bestowed upon such men as Captain Abney, Dr. Eder, Carey Lea, and many others for the invaluable services which, through their untiring energy on the field of photo-chemical research, they heve rendered to our beloved profession. Yet, with all due appreciation of these scientific investigations, and the many valuable discoveries to which they have led, it appears to me that no line of research in photographic chemistry has brought less direct tangible benefit to the practical worker than that on dry-plate developers, ferrous oxalate and alkaline pyro, in more or less modified forms, being to-day, as they were five years ago, the only reducing agents in practical use with more than 95 per cent. of all the photographers on the globe.

Here, then, seems to be a chance for the introduction of something comparatively new, and on that ground I hope to be pardoned, this being my first publicly-committed offence in this direction, for bringing to the notice of this Convention a developing agent which, though photographic periodicals have once or twice mentioned it, and though its name, "hydrochinon," is undoubtedly familiar to many, is actually so very little known, that a few words in its favour may perhaps tend to bring it into more general use, and eventually gain for it an appreciation which it so highly deserves. The chief reason for its lack of present popularity is probably its rather high price; but, were its excellent qualities better known, I have no doubt but that its apparent expensiveness would no longer deter photographers from engaging it's valuable services, for, in the end, hydrochinon will prove just as cheap as pyro, and, perhaps, more so than ferrous oxalate.

Hydrochinon, a derivative of chinon, is an hydro-carbon of a composition $C_6H_4(HO)_2$ similar to that of pyrogallic acid $C_6H_4(HO)_2H_2$, and its properties, too, bear a strong resemblance to those of this, our most important deoxidizer. Its capacity as an oxygen absorber is even greater than that of pyro, the comparative energy of my normal developers being as nine to seven in favour of hydrochinon; but this affinity for oxygen is not as greedy as that of pyro, and its action, therefore, less violent and under better control, and in this property of applying its great reducing force slowly, gradually, without unnecessary waste, and without exhausting its strength from the outset, I find the chief advantage of hydrochinon over pyro. Its developing action, as said before, is necessarily slower, but, on account of the great constancy of its reducing power, marvellously effective, every molecule of the exposed film, no matter how feeble the impact of light, having to submit in due time to its persistent and apparently untiring energy. Its keeping qualities, too, whether in stock solution or mixed developer, are accordingly excellent. I have a case on record when, with six ounces of developer containing thirty-six grains of hydrochinon, I developed 168 plates, transparencies, and line work negatives, without any addition whatever, by merely slightly increasing the time in the camera, after which the mixture was bottled, and served as an excellent "starter" for several subsequent exposures. A patent rubber-stoppered beer bottle full of the stock solution put up on January 5th, and kept in a dark-room at a temperature varying from 50 to 90 deg., is to-day almost colourless, and good as freshly mixed. Hydrochinon is but sparingly soluble in cold water, fifteen grains per ounce being about a saturated solution; but this is amply sufficient for practical use.

Another excellent quality of hydrochinon is the beautiful tone of its deposit, a fine, velvety engraving-black, and a magnificent clearness of shadows, which, for transparencies, lantern slides, and line work negatives especially, is unequalled by any other developer of my acquaintance. Alum and restrainer are unnecessary. The addition of bromide changes the tone to a rich brown, but it should be made very cautiously, as one developer—one ounce of a developer of a ten per cent. solution of potassic bromide—will exercise a quite perceptible retarding action, and render the mixture rather unfit for future use. A few drops of a one per cent. solution of hypo will to some extent restore the energy of the developer, but such doctoring is, at the best, somewhat hazardous. My formula—which, after much experimenting, I have found, in more than four years' practice, to be thoroughly reliable and in every respect satisfactory—is follows:

No. 1.—Soda carbonate	60 grains
Water	1 ounce
No. 2.—Hydrochinon	12 grains
Soda sulphite	60 „
Water	1 ounce

For use mix—

No. 1	1 ounce
No. 2	2 ounces
Water	1 ounce

The water is added either warm or iced, according to the season, in order to give to the developer the proper temperature.

The image will make its appearance rather slowly—on a properly-exposed plate in about two or three minutes; but, once started, development will proceed rapidly and progressively to the attainment of the finest detail and any required density. The film will never become stained under the most protracted development, and, owing to the strong tanning action of the hydrochinon, frilling, even in warm solution, is exceedingly rare. The same conditions that govern pyro development, with regard to intensity and detail, hold good in the case of this reducing agent, an increase of hydrochinon giving strength, and dilution producing detail. The amount of alkali in the formula given above being already large, I do not favour an increase of it with a view of forcing up detail, my mode being to obtain the proper intensity first, and then, if required, finishing up for fine detail in water made slightly alkaline with soda carbonate. The plate is, of course, transferred to this without washing.

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FILM NEGATIVES.

BY E. H. JAQUES.*

There is undoubtedly a strong prejudice in the minds of most photographers, both amateur and professional, against a negative in which paper is used as a permanent support, on account of the inseparable "grain," and lack of brilliancy in the resulting prints; and the idea of the paper being used only as a temporary support does not seem to convey to their minds a correct impression of the true position of the matter.

It may be as well, before entering into the technical details of the manipulation, to consider briefly the advantages to be derived, which will be better appreciated after an actual trial.

My experience (which is at present limited) is, that they are far superior to glass for all purposes, except portraiture of the human form, or instantaneous pictures where extreme rapidity is necessary; but for all ordinary cases of rapid exposures they are sufficiently quick. The first advantage, which I soon discovered, is their entire freedom from halation; this with glass plates is inseparable, and even when much labour has been bestowed in backing them, the halation is painfully apparent.

These films never frill, being made of emulsion which has been made insoluble.

Compare the respective weights of the two substances, one plate weighing more than a dozen films of the same size.

Again, on comparing a stripped film negative with one on glass of the same exposure and subject, it will be found there is a greater sharpness or clearness in the detail, owing, I am of opinion, to the paper absorbing the light immediately it has penetrated the emulsion, the result being a brilliant negative. Landscapes on stripped films can be retouched, or printed from on either side, and the advantage in this respect for carbon or mechanical printing is enormous.

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* Presented at the Chicago Convention.

* Abstract of a paper read before the Birmingham Photographic Society.

Now imagine the tourist working with glass, and compare him with another working with films. The one works in harness, tugging probably half a hundred weight of glass with him from place to place, paying extra carriage, extra tips, and in a continual state of anxiety as to possible breakage, difficulty of packing, and having to be continually on the look-out for a dark place to change the plates, and perhaps on his return finds numbers of his plates damaged, owing to friction on the surface ; while the disciple of *films* is lightly burdened with only camera and slide, and his (say 200) films in his pocket, for they lie so compact together.

Then the advantages to the tourist abroad—their name is "legion," not the least being the ease of guarding your exposed pictures from the Custom House officials, who almost always seek to make matters disagreeable in this respect ; and lastly, though not least, the ease with which the negatives can be stowed away in envelopes, or albums, &c., when reference to them is easy in the extreme.

Now, having come (rightly, I think you will admit) to the conclusion that films have these advantages, you naturally ask, What are its disadvantages ? Remembering then that I am only advocating stripping films, I consider they have but two disadvantages :—1st, They entail some additional outlay in the way of apparatus, &c. 2nd, They are a little more trouble to finish than the glass negatives, which sinks into insignificance when the manifold advantages are considered.

I will now show how I work the roller slide (Eastman, I prefer), and also note the indicator. I have had this made by Mr. Place, showing the exact position of the paper before and after exposure. My friend, J. H. Pickard, has fixed one on his slide, which shows, in addition, the number of films exposed (automatically). I also show here the film carriers for the cut sheets. A substitute for these can be made of a piece of thin wood, and springing this slip in your dark slide over the paper, and exposing in the usual way. The cut sheets can be used also in Pumphrey's and other changing slides. There is one fault, if it may be called a fault, for it is more at the door of the operator, and not the films or slides, viz , the number of exposures. Surely there is no necessity to expose twenty-four films in an hour or so because you have the power to do so.

In order to deal effectively with the second objection I mentioned—viz., the extra trouble and perseverance—I propose, with your permission, to carry a negative through the different stages from exposure to completion, and, in so doing, I shall endeavour to make the process clear to you, and hope to enlist your attention.

The developer I use is slightly different to the Eastman Co.'s, and is as follows :—

A.—Sulphite of soda...	4 ounces
to be dissolved in 8 ounces of hot distilled water, then rendered slightly acid with citric acid ; then add—	
Pyrogallic acid ...	1 ounce
Water ...to make up to	10 ounces
B.—Pure carbonate of soda...	1 ounce
Water ...to make up to	10 ounces
C.—Pure carbonate of potash	1 ounce
Water ...to make up to	10 ounces
D.—Bromide of potassium ...	1 ounce
Water ...to make up to	10 ounces

I have here two half-plate films exposed at 8.30 a.m. to-day, with one five and one six seconds' exposure, subjects chiefly middle distance. I take 90 minims A, 10 minims D, and 90 minims B, and make up to 2 ounces water. I do not soak the films in water ; there is no need for it ; in fact, it is prejudicial to do so. I place the film face uppermost in the dish, and pour on the developer on the centre of the film. You will observe that they lie perfectly flat, and are free from air-bubbles. Rock the dish continually during development, and when the high lights are out, add 10 to 90 minims of C, and finish development. The negatives being complete, I ask you to observe that both are of equal quality, proving the latitude of exposure permissible. I now coat a piece of glass, half-an-inch larger all round the negative, with india-rubber solution (Eastman formula), and squeegee the negative face downwards upon the rubber, a sheet of blotting-paper and oil skin interposing between the negative and squeegee to prevent injury to the exposed rubber surface, and then place the negative under pressure, with blotting-paper interposed to preserve until moderately dry only.

I then pour hot water upon it, and gently rocking the dish ; you see the paper floats from the film without the necessity for pulling it with a pin, and leaves the film negative on the glass. Now, the instructions say remove the remaining soluble gelatine with a camel-hair brush : but, unless it requires intensifying (which no properly-developed negative should require), you need not do so, but simply pour on the gelatine solution (see Eastman formula), well covering the edges of the film, and put on a level shelf to dry.

I will now take up a negative in this state on the glass, but dry, and carefully cut round the edges of the film, and you see I can readily pull off the film with its gelatine support.

Having now passed through the whole of the process, it behoves us to consider for a few minutes the causes of failure in the hands of beginners, and their remedies.

(1) The rubber will not flow over glass—solution too thick—glass greasy. (2) Rubber peels off on drying—dirty glass. (3) Negative not dense enough—use more bromide, longer development. (4) Gelatine cracks on being pulled off—add more glycerine. (5) Gelatine not thick enough—gelatine varnish too thin, not strong enough. (6) Does not dry sufficiently hard—too much glycerine.

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.*

VIII.—Fixing and Clearing the Slides.

When the developed plates have been in the alum bath long enough to harden the film they should be rinsed several times with rain water, and then be placed in a fixing bath composed as follows :—

Hyposulphite of soda ...	4 ounces
Distilled water ...	20 ounces

Much of the hyposulphite of soda in the market is of very bad quality, and should be avoided. Good hyposulphite is cheap enough, and can be obtained from any dealer of reputation. The common hyposulphite, used for bleaching paper, is unfit either for fixing negatives or paper prints, and is often sold by slop dealers instead of the genuine article.

Allow the plates to remain from fifteen to twenty minutes in the fixing-bath, rocking the dish occasionally, and then, before taking them into daylight, wash them three or four times, to remove as much as possible of the fixing solution. After this they should be washed under a tap for a couple of hours, which will be quite sufficient to free them from the remaining traces of hyposulphite. If running water be not available, put the plates in a deep dish, quite full of water, and change the water every half hour, and leave them to soak all night. In the morning change the water three or four times, and transfer them to a clearing bath, which will make the plates look clean and brilliant, and also remove any precipitate of lime, &c., from the film.

Several different clearing solutions may be used, but the two following are both simple and satisfactory.

The first is one recommended by B. J. Edwards, and is made up thus :—

Alum, powdered...	1 ounce
Sulphuric acid ...	1 „
Water (distilled)	20 ounces

The plates may be immersed in this bath for a minute or less, or the solution may be repeatedly poured over them for the same length of time, as preferred. They should not be left in the bath longer than a minute, or frilling may ensue. A good plan, when a large number of plates has to be cleared, is to place about a dozen rapidly in the clearing bath, and as soon as all are immersed, take out the plate first placed in the bath, and holding it under a gentle stream of water from the tap, rub the whole of the film carefully with the fingers, and put the plate in a dish of clean water. Do this with all the rest as quickly as possible, and then leave them all in a dish of water for fifteen or twenty minutes. Be sure that the fingers pass over the whole of the film, or when dry the plate may show ugly patches of calcareous deposit, which will then be removed with difficulty. The final washing water must be frequently changed to get rid of all traces of the alum and acid. If this be not done, the alum, on drying, will crystallise out on the film, and spoil the plate. This caution is necessary, as the writer has seen lantern slides covered with a thin haze from the imperfectly washed-out alum, and the amateur maker was much puzzled to account for this unwelcome appearance.

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* Continued from page 597.

The second clearing solution that we shall mention is one advised by J. D. England :—

Saturated solution of alum	10 ounces
Hydrochloric acid...	½ ounce

This clearing solution works better with some makes of gelatino-bromide plates than that made up with sulphuric acid, and has not such a tendency to produce frilling. If the plates used are liable to frill, reduce the amount of acid to one half, and this strength most plates will stand. These solutions will be found very useful for removing any yellowness from pyro-developed negatives, and a good stock of either should be kept on hand.

When the plates are removed from the final washing water they should be clear and brilliant, having neither patchy marks nor opalescent veil.

They ought next to be stood upon edge on a clean board or slab to drain for a few minutes, and then be placed in a properly constructed rack to dry, in some place perfectly free from dust. The drying must not be hastened in any way, or the slides will be spoiled ; nor must they be handled while drying, which is liable to cause disfiguring marks on the film, resulting from uneven drying. Don't place the plates to dry on a mantelpiece in the winter and think that will do ; there is hardly a worse place, for not only does floating dust abound in the vicinity of an open fire, but the dust on the mantelpiece will be attracted up the damp film, and probably ruin the slide.

Some amateurs are in the habit of using their dishes indiscriminately for developing, fixing, clearing, &c. ; and with negatives such a plan may answer if the dishes are carefully rinsed out after each operation, although it can hardly give the best results, and at best is only a slovenly and needless method. For positives such a course will not do. Each dish must be devoted to only one purpose, and used for that purpose alone. In developing there must be no hyposulphite near the developing dishes. If the dark room be not sufficiently large to have the fixing bath ready prepared in another part of it, do not pour out any hyposulphite until all the plates have been developed, washed, and placed in the alum bath. And after the work is over, do not leave the dishes in a dirty state, or full of used solutions, no matter how tired you are ; but pour away the solutions, rinse each dish several times with clean water, and leave also a little water in them to dissolve out any trace of solutions from crevices, &c.

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.

Amalfi.

> "The time has been,
> When on the quays along the Syrian coast,
> 'Twas asked, and eagerly, at break of dawn,
> 'What ships are from Amalfi?' "

"Raffaelle of Sorrento" was needlessly frightened as to the stormy voyage to Amalfi : the sail once hoisted, the boat flew along under a steady breeze, and the crew took life very easily. Black clouds scudded about, and for a time a couple of embryo water spouts, forming and drifting towards us, caused some anxiety, but before the trumpets touched the sea, they drew up again, and all danger vanished. The sea was far from smooth, and there were moments when we wished ourselves back on the rocks of Capri ; but while crossing the Bay of Positano the wind fell, the sun came out, dispersing the clouds, and the remaining hours were a dream of lazy bliss, as we feasted our eyes on the glorious panorama of islands, the purple mountainous coast, picturesque towns, and fishing villages. The islands of the Sirens were passed—barren, rocky solitudes used in olden days as prisons. Doges of Amalfi have languished away in confinement on the largest rock under the blazing summer sun, and in full sight of the grand coast line so near their native town.

The sailors had now to row hard in the heat and sunny calm, and right glad they were, as we turned the last headland, and the well known landmarks of ancient Amalfi came into sight. There was the old round tower on the jagged heights, seemingly mounting guard, as it did centuries ago, when pirates were the scourge of Amalfi. The Moorish dome of the Cathedral glistened, as the rays of the sun gilded its smooth green and yellow tiles. The great chasm up which Amalfi climbs, opened out, showing the white buildings piled up against the steep rocks, one upon another, clinging like swallows' nests to the walls. We had just passed a small cave where houses and fishing boats nestled among the cliffs, while above, the hills were dotted with vine terraces, olive groves, houses, convents, and churches ; then came a great cave, with boats safely drawn into its friendly shelter above the almost tideless sea.

Amalfi and her surroundings, as viewed from the sea, are surpassingly beautiful ; to the left of the town, perched up on the rocks by a great cavern, you see the long white Capuchin convent, its narrow zig-zag roads winding down to the market place and the shore ; but the old monks who knew so well how to choose the best sites, hold sway here no more. The convent has strangely changed hands, and is now one of the most comfortable hotels in Italy. Now and again a monk is still to be met with, and he who is fortunate in the black art may sometimes secure a picture of him, sitting against the vine-clad pillars at the convent door.

Our boat soon grounded on the beach, and we landed by a narrow plank, and were in a few minutes comfortably ensconced in the Albergo de Cappuccini, built right on the shore facing the raised piazza.

Amalfi and Atrani are divided by a mountain ridge, and time was when they were united by a sea beach, with docks and harborage for their fleets, and when they were important naval powers. Between the years 839 and 1131 Amalfi was the foremost naval and commercial port of Italy. The burghers elected their own doge, and owned trading establishments in all the chief cities of the Levant. Their shipping regulations supplied Europe with a code of maritime laws, and their seamen are said to have invented the compass. The Italian cities were constantly at enmity among themselves, and in 1135, when the ships of Amalfi were in the Bay of Naples, on guard with King Roger of Sicily, the Neapolitans called Pisa to their aid, whereupon the Pisans sailed into the harbour and sacked the city. Two years later they returned and completed the work of devastation, and put an end to the prosperity of Amalfi. Nor was this all : Nature also seemed to be against them. A gradual subsidence of the land submerged the lower quarters of the city, and covered the beach with water, and a fearful tempest, accompanied by earthquake, in 1343, completed the wreckage.

Symonds, in his "Sketches and Studies in Italy," gives a very interesting account of this terrible catastrophe, taken from the writings of Petrarch, who was resident in Naples at the time.

An astrological bishop had predicted that Naples would be overwhelmed by a terrible disaster in 1343. When the day arrived, the people were greatly excited, and neglected their ordinary occupations. At sunset the sky was quieter than usual, but Petrarch, who had stationed himself at a window to observe the moon go down shortly before midnight, had scarcely fallen into his first sleep, when a most horrible noise aroused him. "It would be impossible (says the poet) to relate the terrors of that hellish night. The deluges of rain, the screaming of the wind, the earthquake, the thunder, the howling of the sea, and the shrieks of agonised human beings." Many vessels were wrecked, including one freighted with four hundred convicts, bound for Sicily (no great loss, one would imagine, to that island). Symonds says: "The capital on this occasion escaped the ruin prophesied. But Amalfi was inundated, and what the waters then gained has never been restored to man. This is why the once so famous city ranks now upon a level with quiet little towns whose names are hardly heard in history."

The Hotel Cappuccini on the quay, and the Cappuccini Convent up on the heights, are excellently managed by the brothers Vozzi. The convent, where we had passed delightful days two years previously, being full, we took up our abode at the hotel on the quay, taking our first dinner at the convent, to pay our respects to our friend, Signor F. Vozzi. This gentleman is an accomplished musician, and, after looking to the comfort of his guests at dinner, he mounts the stairs at the end of the Salon (the old refectory of the monks), and, as dessert proceeds, a stillness comes over the company, while Signor Vozzi's rich tenor voice is heard in many of the well-known Italian songs, to his own accompaniment on the guitar.

Amalfi of to-day is neither rich nor powerful; she is not warlike, nor is she any longer harried by the pirates of the good old days; her citizens scarcely number 7,000, many of whom are employed in the manufacture of paper, soap, and maccaroni, while a large number are beggars and loafers. There are sixteen large mills on the river that comes down the great ravine in which Amalfi is built. This ravine is full of the picturesque and beautiful; quaint old bridges span the stream, dark tunnels emerging from under the mills, their entrances festooned with creepers and maiden hair.

There are narrow tortuous passages, with here and there a shady fountain embosomed in ferns, moss-grown walls along the river bank, where the lizards bask in the heat; here an old water wheel, green with the growth of years; further up, the glen closes in, and your walk follows the steep side, along a narrow woodland path among the fern, cyclamen, and crocuses, till you come upon the last mill, a huge structure, many storeys high, evidently built at various stages of its history, until it is now a mass of angles, roofs, walls, and windows, put together in beautiful and artistic confusion. The lower walls are green with ferns and mosses, and the stream, far below, washes the foundations. Too vast for the camera, we sat down to sketch it, confusion thereupon becoming worse confounded, till we were so hopelessly mixed as to the ownership of certain windows by certain walls, and in the perspective of the many red roofs and gables, that we abandoned the idea.

(*To be continued.*)

Patent Intelligence.

Applications for Letters Patent.

12,714. Gustave Gillman, 150, Cromwell Road, South Kensington, London, for "Improvements in apparatus for developing and fixing photographic negatives and positive prints."—September 20th, 1887.

12,733. Theo. Endean and Frederick George Clark, 52 Chancery Lane, London, for "Improvements in photographers chairs."—[Complete specification.]—September 20th, 1887.

12,746. William Thomas Dennis, 36, Southampton Buildings, London, W.C., for "A new or improved apparatus for viewing transparent pictures or representations, and the images projected on the focussing glass or screen of a photographic camera."—September 20th, 1887.

12,940. Frederick Woodward Branson, 14, Commercial Street, Leeds, for "Improvements in photographic shutters."—September 24th, 1887.

Patent on which the Eighth Year's Renewal Fee of £10 has been paid.

3760 of 1879. W. B. Woodbury.—"Producing designs on metallic surfaces."

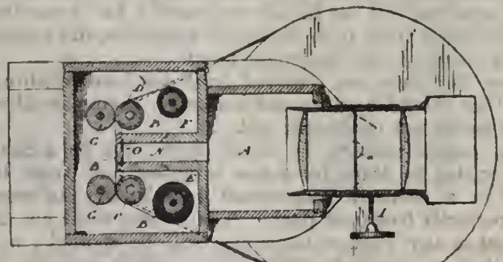
Specification Published.

12,755. John Leisk, of 169, Commercial Street, Lerwick, Shetland, Merchant, for "A new or improved instantaneous shutter for photographic cameras."—Dated Oct. 6th, 1886. The apparatus, figured, is described on page 578.

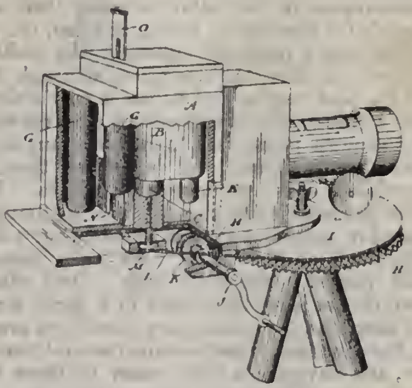
Patents Granted in America.

369,165. John R. Connon, Elora, Ontario, Canada. "Photographic instrument or pantoscopic camera."—Filed April 2, 1887. Serial No. 233,422. (No model.)

Claim.—1. The combination, with the stand I, provided with spurwheel H, and groove, as described, of the photographic instrument pivoted at *a* to said stand, the rollers C D, crank J, worm-pinion K, and cord L, all substantially as and for the purpose specified.



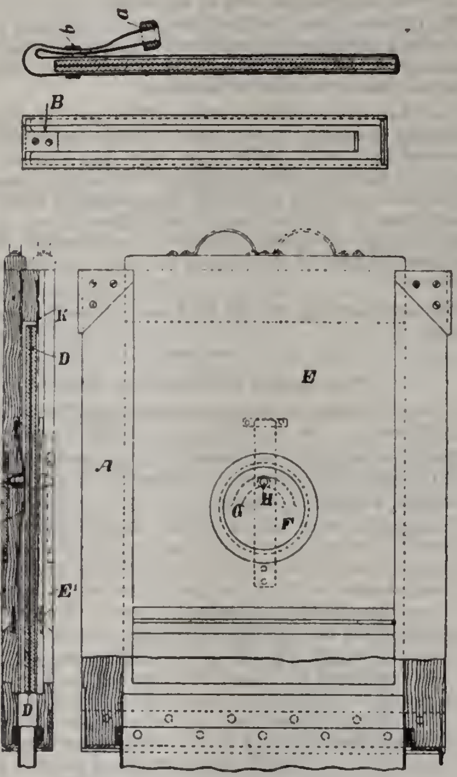
2. The combination with the stand provided with spurwheel and groove, as described, and the photographic instrument pivoted at *a* to said stand, of the crank J and pinion K on said instrument, the roliers C D E F, the pulleys M on the spindles of the rollers C D, and the cord L, passed around said pulleys and seated in the grooves of said stand, substantially as and for the purpose specified.



369,646. Richard Koppe and Oswald Moh, Goerlitz, Prussia, Germany, assignors to Koppe and Moh, same place, for "Photographer's bag-case and plate-holder."—Filed May 27, 1887. Serial No. 239,573. (No model.)

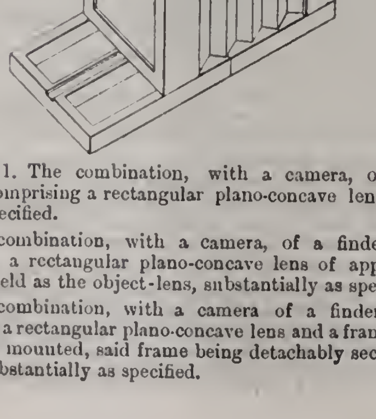
Claim.—1. In a photographic apparatus, the combination of the turn-plate F, the semicircular groove G, pin H, spring I, and band K, substantially as and for the purpose set forth.

2. In a photographic apparatus, the combination, with



sensitive glass plates, of interposed sheet-metal plates having their edges bent, cut, and overlapping the said sensitive glass plates, substantially as and for the purpose set forth.

369,515. Willard H. Fuller, Passaic, N J., assignor to the Scovill Manufacturing Company, New York, N.Y., for "Finder for photographic cameras."—Filed May 23, 1887. Serial No. 239,037. (No model.)



Claim.—1. The combination, with a camera, of a finder therefor, comprising a rectangular plano-concave lens, substantially as specified.

2. The combination, with a camera, of a finder therefor, comprising a rectangular plano-concave lens of approximately the same field as the object-lens, substantially as specified.

3. The combination, with a camera of a finder therefor, comprising a rectangular plano-concave lens and a frame in which said lens is mounted, said frame being detachably secured to the camera, substantially as specified.

Correspondence.

WANTED—ORTHOCHROMATIC FILMS.

Dear Sir,—The Autumn tints will be on us very quickly, with all the beauty of variety which they give to the landscape, and though we cannot at present take the tints, we might with suitable films catch the true gradations. I know there are isochromatic plates in the market, but I use by preference a roll-holder. Will no manufacturer take a hint, and give us films and rolls properly sensitized for the glorious reds and yellows of autumn landscapes, and of sunrise and sunset all the year round, or, in another province, suitable for the proper portrayal of "the maiden of blushing fifteen," and even of that less beauteous subject who has no difficulty in finding "an excuse for the glass?" But, joking apart, nearly all photographic work or play would be the better for orthochromatic treatment, all the year round, and none would be the worse. There is a gap. Who will fill it?—I am, yours faithfully,

R. H. Tiddeman.

H.M. Geological Survey, 28, *Jermyn Street, S.W.*

A PHASE OF COMMERCIALISM.

Dear Sir,—If you will allow me to explain the reason for the "New Commercialism," of which Mr. Gotz complains so bitterly in your last issue with reference to the description in "The Photographer's Indisdensable Handbook" of the "Volute" shutter, and its crediting to the London Stereoscopic Co., I think I can make it plain that the fault, if any, lies at Mr. Gotz's own door. As the photographic trade must by this time be well aware from the number of communications some of them have received upon the subject, every effort was made by Mr. Welford, the compiler of the work in question, to obtain information of the fullest and most accurate character concerning every variety of apparatus in the market.

As he explains, however, in his introductory notes, some firms entailed considerable extra labour upon him by their entire disregard of his communications, whilst, as he further explains, some things are credited to certain firms not the actual makers, simply because they make a strong specialty of them, or were able to lend us engravings. This being so, Mr. Gotz practically has his explanation in the book itself, for the fault, as I have before stated, is his own. The facts of case are these:—On May 14th and 17th, Mr. Welford received from that gentleman a few details of his ortho- plates and silver emulsion paper, with three or four words only relating to his camera and shutter. Mr. Welford at once wrote for further particulars, and asking for electros or wood blocks of his specialties, but could get no reply, although a second letter, and subsequently a postcard, followed. The next communication received from Mr. Gotz was dated August 10th, and dealt entirely with the subject of plates and paper again. No blocks of the shutter were received by us, nor had we any advice of any being sent off. We were, therefore, for all practical purposes, without either details or illustration of the article in point when Mr. Welford, in the course of his researches, called upon the London Stereoscopic Company, who make a feature of it in their catalogue. That firm not only gave him every information he required concerning it, but supplied an electro for its illustration, and at the same time informed him that the inventor or maker of the shutter was quite willing it should appear in their name, and consequently, as we could get no information concerning it from Mr. Gotz, we inserted the illustration lent by the Stereoscopic Company, and credited it to them. Surely, if the matter is one of so much importance to Mr. Gotz, one would have thought it would have been worth his while to take a little trouble when asked to supply us with the necessary information. I have no wish to occupy your space further, so having vindicated our *bona fides* in the matter, remain, yours respectfully, Henry Sturmey, Editor "P. I. H.'

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting took place on the 22nd inst., H. **Pringle** in the chair.

H. M. **Smith** showed a negative, the first he had attempted upon a stripping film; it left nothing to be desired.

A. L. **Henderson** drew attention to a substance which appeared to be a dried film of collodion and castor oil. He believed its application to photographic purposes had been patented.

Algin, as a substitute for gelatine, having been referred to, the **Chairman** said it was very much influenced by mineral and vegetable acids, but in opposite directions. Silver nitrate to an extent combined with it, which rendered it quite unsuitable for emulsion work. Toning gelatine chloride prints was discussed, and the sulphocyanide method, according to the Chairman, yielded blacker tones when mixed with phosphate of soda.

Brown tones of gelatine bromide prints could be changed to purple, Mr. **Henderson** stated, by steeping the prints, after fixing and washing, in a solution composed of gold chloride, 2 grains; sodium acetate, 20 grains; water (acidified with acetic acid), about 10 ounces.

W. E. **Debenham** had noticed that some chloride prints, if kept for a few days, would fix of a very good colour, and not require toning.

H. D. **Atkinson** exhibited a negative as an exceptionally bad example of frilling, and was advised to soak the remainder of the batch in a one-grain chrome alum solution for a few minutes previous to development.

C. G. **Collins** exhibited his new detective camera, and a number of very good photographs taken therewith. It was constructed somewhat similar to the Scovill detective camera, the whole apparatus for ¼-plate, or 5 by 4, being contained in a small travelling case devoid of projections.

J. B. B. **Wellington** also showed a detective camera, the design of which differed very little from the Collins make.

North London Photographic Society.

At the meeting held on September 20, at Myddelton Hall, A. **Mackie** in the chair, a number of prints were exhibited from negatives taken by members at recent outdoor meetings or during holiday tours, and, in accordance with a promise made at the last meeting, A. Liddle had sent some specimens of "pinhole" photography, together with the apparatus used, which was of American manufacture, and sold under the name of "The Ready Fotografer."

John Oakley asked if any of the members had any experience of iodine as an eliminator of hypo in prints. He explained that during his holiday tour he had met a photographer who recommended its use. The method of its application was:—A small quantity of an alcoholic solution of iodine was to be added to the washing water, the result of which was that the back of the prints turned blue; the washing was to be continued until the colour was removed, when it might be assumed the hypo was eliminated.

The **Chairman** said that he had never heard of iodine being used in this connection, but the use of iodide of starch as a test for the presence of hypo was well known.

F. W. **Cox** asked the best meams of stripping the films from negatives on ordinary gelatine plates.

E. **Clifton** soaked his waste negatives in diluted sulphuric acid. He found in most instances the film came off entire.

A Member said that it had been suggested to him that the plate should be first treated with a solution of chrome alum to harden the film, and then with a solution of fluoric acid, which would effectually effect a separation.

A question was asked whether it was possible to copy a Daguerreotype, and, if so, whether any special arrangement was required for lighting.

Mr. **Clifton** said that the only difficulty was in avoiding the reflection from objects in front of the picture appearing in the copy. The method he adopted was to illuminate Daguerreotype by a side light only, and to cover the camera with a black cloth with a hole in it for the lens. Except for the difficulty in dealing with the reflection the matter was quite an easy one, and the results were very satisfactory. The iridescent stain which appeared on some Daguerreotypes might be removed by treating with a solution of cyanide of potassium.

J. H. **Bird** asked the best method of copying a paper print so as to avoid the grain showing in the copy.

Mr. **Clifton** advocated that the print to be copied be illuminated with a perfectly diffused light. He had obtained very good results by constructing a tunnel of tissue-paper, at the end of which he placed the print to be copied.

The **Chairman** said that doctors differed as to the best method of lighting in copying paper prints. Many experienced workers advocated the use of a side light only, and that at an acute angle. In making a series of negatives for lantern transparencies from unmounted 10 by 8 prints he had soaked the prints in water, placed them in optical contact with glass plates, and copied them through the glass. In the transparencies from these negatives the grain of the paper of the original print could hardly be detected.

The next meeting will be held on October 4. Visitors are invited.

Birmingham Photographic Society.

The usual monthly meeting was held at the Technical School, Bridge Street, on the 22nd inst., J. J. **Button** in the chair.

The following gentlemen were elected members of the Society:—H. Copnall, G. Greeuing, H. Hollins, H. R. Leech, R. Mason, E. Shilton, and S. F. Vernour.

Photographs were shown by Mr. Harrold Baker (very fine vignetted cabinets and views), framed bromide prints by Mr. Dennison, views of Norway by Thos. Taylor, drying racks and phantom shutter by W. Tylar, and a number of negatives taken on a new plate which combines the force of the old plates with the speed of the most rapid plate, by A. Pumphrey.

A question relating to the use of combined toning and fixing bath was answered by Messrs. Middleton, Pumphrey, and Tylar respectively:—(1) Chief objection, sulphur—use a little common salt in the bath; (2) not used by professionals, costs more, can take straight from printing frames and put into bath; (3) used with success; prints toned five or six years ago still good.

E. H. **Jaques** then gave his paper on "Film Negatives" (see p. 618), which was a success in every way.

Mr. **Pumphrey** thought the films would be liable to take up silver whilst printing.

J. H. **Pickard** said coating the india-rubber with collodion before transferring the wet negative would obviate this.

In answer to an enquiry, Mr. **Jacques** said bromide prints can be got from films very readily.

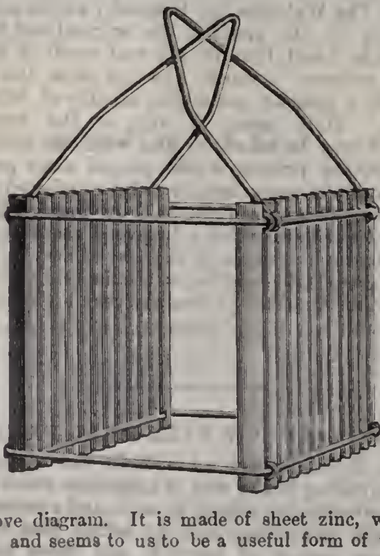
Talk in the Studio.

Dallmeyer's Optical Works.—The optical works of J. H. Dallmeyer will shortly be removed into fresh premises in Newman Street, where a very complete manufactory is now in the course of arrangement.

The Latest Story about Lightning Pictures.—The following from a Toronto paper is worthy to rank with some other stories which we have from the western hemisphere. "A young girl was dressing in her room during a thunder storm. Her pug dog ran in. She clasped it to her bosom. A flash of lightning instantly killed it. She was horrified to find that the image of her dog had been photographed on her bosom. There seems to be no way of removing the picture, which gives every shade, colour, and wrinkle of the canine form."

Lectures on Photography at the Birkbeck Institution.—A course of about thirty lectures, fully illustrated by experiments and demonstrations, on Photography, practical and theoretical, will be given by Chapman Jones, on Wednesday evenings, at seven o'clock, commencing October 5th. This course will be specially suitable for amateurs who wish to become acquainted with the art, as well as for professional photographers who desire a systematic knowledge of the subject. An examination at the end of the course is conducted by the City and Guilds Institute, who grant certificates and prizes to those who prove themselves qualified. Fees for the course—Members of the institution, 12s.; non-members, 15s. Half-price tickets are issued to those engaged in professional studios, manufacturers' laboratories, or dealers' warehouses; these half-price tickets cannot be obtained before October 5th, and will be issued in the lecture room only, either before or after a lecture. *Syllabus of course of lectures.*—About twelve lectures on Preliminary Matters, namely:—Applications of Photography—History of its development—The chemical action of light—The chemistry of simple substances in frequent use, but only so far as practically concerns photographers in ordinary work—Gelatine, albumen, asphalte, pyroxyline, &c. Optics.—Reflection, Refraction—The measurement of light—Actinometers, sensitometers, photometers—Decomposition of light—The spectrum—Absorbing media—The illumination of the dark room. About five lectures on Apparatus and their use, namely:—Cameras and accessories—Testing cameras, &c.—Exposure shutters—Changing-boxes—Roller-slides—Film-holders—Stands, &c. Lenses.—Landscape, rectilinear, symmetrical—Portrait combinations, old and new—Calculations concerning lenses—The diaphragm, its uses and effects—Rapidity—Depth of definition—Angular aperture and angle of view—Distribution of light—Flare spot—Distortion—Chromatic aberration—Achromatism—Spherical aberration, &c.—The choice of lenses and their use. About thirteen lectures on Photographic Processes, namely:—Negatives.—Production of negatives with gelatine dry plates and films—Various developers, their use and abuse—Methods of intensification, &c., &c.—Faults in general: how to correct and how avoid them—Portraiture, landscape work, copying, &c. Collodion Plates.—Their preparation and use—Collodion positives. Daguerreotypes.—Paper Negatives (Calotype). Emulsions.—Gelatine and Collodion—Preparation—Coating plates, &c. Printing.—Silver printing—Printing by development—Printing by salts of iron—Chrysotype—Cyanotype—Platinotype—Printing in chromated gelatine—Pigmented tissue—Single and double transfer printing in carbon—gelatine reliefs, &c.—Printing in uranium salts, &c. Woodburytype—Stannotype—Filligrain or water mark pictures—Heliotype—Collotype—Photo-lithography and zincography—Photo-etched plates, &c. Enamels.—Dusting-on process. Transparencies.—Enlarged negatives—Reversed negatives. Art as applicable in Photography.—Balance—Form—Chiaroscuro—Choice and arrangement of subjects, &c. Application should be made to the Secretary, Bream's Buildings, Chancery Lane, E.C.

A Portable Washing and Draining Rack.—From Hinton and Co., of 38, Bedford Street, Strand, we have received a folding rack, the general construction of which is made evident by the above diagram. It is made of sheet zinc, with tinned iron wires, and seems to us to be a useful form of the folding metal rack.



Sketches for Reproduction by a Block Process.—The following hints are from a circular issued by the Direct Photo-Engraving Company. Every care should be taken to keep the drawing perfectly clean, flat, and free from spots of any kind; any divergence from this rule is likely to be increased in the block when finished. The quality of the ink used is also of the greatest importance; and we can suggest none better than Stephens' Ebony-stain or Indian ink, mixed with gamboge, which should be sufficiently thick as to produce a good full black line. Great care should be taken by the artist to produce the lines of his drawing firm, bold, and clear; and, however fine his lines may be, they should be clear and distinct, else a certain rottenness is sure to ensure; and however careful the etcher may be with the plate, the result will not be so satisfactory as if this feature of the drawing had been carefully adhered to. In removing pencil or other marks from the drawing, care should be taken not to interfere with the firmness or depth of blackness of the lines by too much rubbing. In cleaning drawings the best material to use is bread; and it is advisable that marks or erasures should be taken from the drawings by the artists themselves. Hard india-rubber should be avoided, as it is likely to damage the lines. In the shading of a drawing, it is necessary that it should be kept open, and that the lines should be kept firm and clear; likewise in cross-hatching. The intensity of shade should be obtained by an increase in the thickness of the lines, and not by their being placed too close together or confused by fine lines.

Photographic Club.—The subject for discussion on October 5th will be "Developers and Developing." Saturday outing at Broxbourne; train from Liverpool Street. During the Exhibition of the Photographic Society, the members of the Club will be pleased to see any gentlemen taking an interest in Photography at their Wednesday evening meetings.

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To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

A. G. M.—Occasionally we have seen advertisements of those who give instruction, but we have no knowledge of any competent teacher just now.

Henry Sturmey.—Thank you for the cutting, of which we have made use.

C. J.—Thanks.

Chas. Eld. Shaw.—We are inclined to think that it is a swindle, and, moreover, a swindle of the worst kind, as intended to defraud those out of employment and in needy circumstances; but the circular is so cautiously worded as to make a conviction almost hopeless in the present state of the law. You might write to the superintendent of police in the town referred to, and ask if he knows anything of the advertiser; and, by similar means, you might perhaps ascertain if the persons who are represented as having sent testimonials really exist. The circular has been posted to you.

C. R. V.—1. The idea is rather ludicrous, and by no means complimentary to Ruskin, but hardly of sufficient importance to justify the insertion of such a letter. 2. Write and ask the question; the address is to be found in the list of members of the Photographic Society.

Chas. Bright.—The term hardly applies, unless its significance is somewhat strained; but if you clearly define what you mean, no misunderstanding is likely to arise.

T. Sims.—A small apparatus is sold for 21s., but the workmanship of this is not very good. Still, if you have the instrument made for you by a first-class workman, it will cost you several pounds.

Boxer.—First treat with a cold and dilute solution of caustic potash containing about one drachm to a pint of water. This should be allowed to act for about ten minutes, during which time the surface of the paper should not be rubbed. It is then rinsed, and immersed in a solution of bitartrate of potash saturated at 100° F., after which you must proceed as formerly.

C. W. V.—The case is a difficult one, and all we can suggest is the arranging of the pieces as closely together as possible, the face being down, after which the edges are gummed, and a piece of damp tissue paper is laid on the back. Now cover the damp paper with a piece of glass large enough to cover all but the gummed edges, and when the edges are dry, remove this glass. The damp paper, in contracting, will now draw the pieces into closer contact, and you may be able to copy by means of the camera. Thanks for the enclosure.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1518.—*October* 7, 1887.

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THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

The opening *soirée*, which took place at the Pall Mall Gallery on Saturday last, was, as usual, a pleasant opportunity of saying a friendly word or so by those who only meet very occasionally, and the regular course of the Exhibition commenced on Monday last, it being arranged to keep it open till Monday, November 14th.

The judges of the pictures are James Glaisher (President of the Society), William Cobb, William England, W. F. Donkin, F. Hollyer, H. S. Mendelssohn, and George Davison; and, in announcing the following awards, we consider it necessary to state that the secretary of the Society (Professor Donkin) informed us that the awards are not to be considered final until they have been ratified by the general council of the Society, an event which, in the ordinary course of things, will not take place until after the publication of our present issue. Still, he said that in the event of an earlier ratification being made, he would communicate with us; but no such communication has been made up to the time of going to press.

It is necessary to mention the above, as at the *soirée* it was very freely stated that out of the six elected judges (the president being a judge by virtue of his presidential office) three were very strongly opposed to one of the awards on the ground that the exhibit concerned did not merit such an honour.

The following, then, are the picture exhibits to which the medal awards have been provisionally made, the order being that of the catalogue.

No. 17 (Elephants at the "Olympia," by G. P. Cartland) is a frame containing pictures which we have already noticed, and it shows how strikingly photography has progressed as far as its application to the recording of rapidly-shifting scenes.

No. 30, "On the Lonely Shore," by Harry Tolley, is a fully-gradated and rich-toned picture of rock, water, and atmospheric effect; and No. 40, an exhibit of H. P. Robinson, shows a flock of sheep with pretty effect, while two tallish female figures ingeniously introduced—one with a half smile, and the other meditative—serve to attract much attention to the exhibit. The title is "Carolling," and the sheet is admirably printed in warm-tone platinotype. T. H. Green's "Head of Buttermere" (No. 236) is a gem of its kind, and renders the distance over hill and water with a perfection of effect rarely seen in a photograph.

Few will be disposed to question the good judgment of the medal award in the case of No. 267—a fine series of lake and hill views by H. C. Pettit; or in the case of No. 268—a series of pictures taken in gaslight by John F. Roberts—pictures which have already been noticed in our columns, but which, according to the rules, are ineligible for admission to the Exhibition, because they have been previously exhibited in London.

With reference to 283—large portraits, taken direct, by Byrne and Co.—and an enlargement (No. 290) by Fred Muller, we must speak highly, as these exhibits are very far ahead of the usual run of commercial portraits of the show-case. The photo-micrographs of Andrew Pringle (Nos. 389 and 398) represent difficult work and definite progress, while those of Fred E. Evans (No. 452) are good commonplace photographs of every-day subjects, such as one may see in the windows of dealers in lantern slides.

Dr. Emerson's "Poacher" is a work of art standing altogether by itself, and well illustrates this worker's endeavour to break through the old convention, which ordains that every photograph should show each object with preternatural clearness. The streak of light in the east warns the poacher that he must cease operations, and the picture is realistic in a high degree.

No. 410, a specimen of photo-engraving by Annan and Swan, is vigorous and well graduated down to the lowest tints; and No. 412, studies by J. B. B. Wellington, is highly meritorious, but placed too low for convenient study.

It may be that the award given the photo-engraving (No. 394) "The Welcome," by Boussod Valedon and Co., was rather given for the merit of the original and for skilled after-work by hand, than for the real merit of the photo-engraving process. Awards like this show the difficulty of obtaining a judging committee capable of doing justice all round. How many, if any, of the judges were qualified, it may be asked, to deal with the merits of the photo-engraving process which played some part in the production of the magnificent exhibit numbered 394?

The series of studies (No. 547) by Frank M. Sutcliffe should be looked at carefully by every visitor, as showing what photography can do in the way of making pictures; while the last medalled exhibit on the list (No. 635, Yachting Studies by W. H. Hyslop) deserves very high praise.

The general run of the Exhibition will be dealt with in future articles.

* * *

APPARATUS AT THE PALL MALL EXHIBITION.

This year there has been a breach in the custom of admitting anything in the way of apparatus which the enterprising commercialist elected to send, and a committee was formed with instructions only to admit that which presented some feature of novelty, and these instructions appear to have been substantially adhered to. Among cameras there are intruments of the detective type by Thomas Samuels (638), C. G. Collins (648), J. F. Shew (651), J. B. Thiselton (662), W. Watson and Sons (663), Marion and Co. (670), and J. Robinson and Sons; but as far as we can see, the novel points of all these have been described in the Photographic News since the last Exhibition. The same remark also applies to the folding cameras shown.

The Eastman Company shows a new pattern of roller slide which has not yet been illustrated or described in our pages; and other roller slides with new features since last year are those by Morgan and Kidd, McKellen, and Thornton.

Arundel and Marshall's plate-boxes, with paper-covered tin grooving, and ends turning down for the removal of plates, have already been described in the Photographic News; while the same remark applies to the main features of the stereo shutter of Reynolds and Branson, No. 656 W. Tylar, of Birmingham, has a good selection of his wares, including his metal dark slides and folding trays. The chronographic watches of Lezard and Co. will be looked on with interest.

We may, perhaps, refer further to the apparatus department. No awards of medals were announced at the *soirée.*

THE CAMERA CLUB.

A note in the October number of the Club organ is thus worded :—

The winter series of meetings is about to commence. A constant round of events and discussions which should prove interesting and useful will be kept up; those who are in search of information will generally find some members in the Club who are able and willing to solve problems and satisfy querists, and generally an active and a sociable time is at hand. Members, then, are earnestly requested to make use of the accompanying circular by sending or giving it to some amateur photographer, friend or acquaintance, to draw attention to our central organisation. This action has been taken partly in consequence of it having been forced upon the notice of the executive that a vast number of eligible photographers are still unacquainted with the existence or the character of the Club. Each member will probably have in mind some one enthusiast or beginner who would not fail to benefit both himself and the Club by taking up membership. A large number of candidates continue to come up for election, six being the monthly average for some long period. The total of members is now in excess of 350, but, in view of the smallness of the country subscription, and the large contingent yet unattached to the Club, it is hoped that a general, kindly, and enthusiastic effort will be put forth to extend still further our influence and usefulness.

The circular letter referred to is as follows :—

The Camera Club is a social, scientific, and artistic centre for amateur photographers.

Only amateur photographers are admitted or continued as members. The question of eligibility is decided in each case by the Committee, upon the facts, and without appeal.

The annual subscription is :—For town members, three guineas; for country members, one guinea. A member having a residence within the metropolitan postal district is considered a town member. Members admitted in the course of the year on entrance, pay to the end of the year at the rate of six shillings for each calendar month for town members, or two shillings for country members. The entrance fee is one guinea.

Members may be admitted as life members on payment of ten years' subscription, from which those applying for life membership within three months after election may deduct their previous payments.

The election of members is in the hands of the committee.

Any club or society of amateur photographers, having its club rooms or headquarters at least twenty miles from London, may be admitted to affiliation with this club.

Each affiliated club pays one guinea per year, and is entitled to as many tickets as it may apply for, at the rate of half-a-crown each, entitling the holder—being an amateur photographer, and a member of the affiliated club—to admission to this club, as a temporary member, for not exceeding one week.

The affiliated club also extends its hospitalities, including the use of its dark room, to the members of the Camera Club, during a temporary visit.

The following have already been admitted to affiliation :—

Birmingham Photographic Society.
Bolton Photographic Society.
Cambridge University Photographic Society.
Glasgow and West of Scotland Amateur Photographic Association.
Leamington Amateur Photographic Society.
Liverpool Amateur Photographic Association.
Photographic Society of Ireland.

The club is open on week-days from 10 a.m. to midnight, and on Sundays from 10 a.m. to 11 p.m. It combines the ordinary advantages of a club with the appliances and conveniences of a photographic society, including the use of a well-appointed dark room, available to members at all times. It is intended in due course to provide enlarging and other apparatus too costly to be bought by the ordinary amateur for his private use, and later on a studio.

Many dark rooms and studios in all parts of the United Kingdom, as well as abroad, have been placed at the disposal of the Club by members and others.

All suggestions, from whatever quarter, for the advancement of the interests or wishes of amateur photographers, will receive the careful consideration of the Committee.

A journal of the proceedings of the Club is published and sent free monthly to members.

All members' fees, subscriptions, and other dues are payable to the Camera Club Company, limited, the proprietors of the Club; and the liability of each member of the Club is limited to the amount of his annual subscription, and the sum (if any) unpaid upon the shares held by him in the Company.

All cheques, &c., should be made payable to the Camera Club Company, Limited, and crossed "Martin & Co."

Applications for membership should be addressed to the honorary secretaries, at the Camera Club, 21, Bedford Street, Charing Cross, London, W.C., and a list of the members will be sent to any gentleman desiring it, to enable him to select a proposer and seconder.

HUNTING AFTER PORTRAITS.

The Experiences of a Journalist.

Hunting after portraits is not a fascinating pursuit. The chase is worrying, vexing, irritating. It is full of unexpected pitfalls. To be told to "first catch your portrait," to paraphrase the saying of the immortal Mrs. Glasse which she did not say, is not to end your difficulties. These difficulties sometimes begin just when you have run your portrait to earth. You have to—but perhaps I had better explain what I mean by hunting after portraits.

The pastime consists of two varieties. The first is when the man you want is a well-known character; the second when he happens to be so insignificant that the general public is unconscious of his existence. The process of obtaining the likeness of the well-known man is comparatively easy, but to secure the features of the insignificant individual is often exceedingly troublesome. Such public characters as Gladstone, Bright, Chamberlain, and the like, may at once be put aside. In their case it is simply a question of the choice of one portrait out of a hundred.

You only have to call on a photographic dealer who goes in specially for this line of business and make your selection. But even in the case of a celebrity difficulties sometimes arise. Notably the Queen. Photographs of her Majesty abound, but no two artists ever draw her exactly alike. One artist I know, who is connected with an illustrated paper, never succeeds in shaping the portrait of Gladstone to the satisfaction of the proprietor. It so happens the latter used very frequently to see the great statesman about five and thirty years ago, and he has an impression that the shape of Gladstone's face and head ought to be now exactly as it was then. His recollection is that the face was egg-shaped; consequently the artist always, in his opinion, draws the chin and the forehead too short, while the head from back to front is too wide to please him. It is in vain to point to photographs, or to argue that age alters the shape of a man's head. If photography renders Gladstone's face shorter than he thinks it ought to be, then so much the worse for photography.

It is sometimes rash to go very far from the conventional idea which the public has of a man's face. Had photography been as popular in the days of Palmerston and Lord John Russell as it is now, the minds of Leech and Tenniel would have been sorely exercised. The ideal Palmerston both artists adhered to for something like twenty years, and the alterations which must have taken place in his face were almost ignored. The absence of the means of verification was greatly in the favour of the artist, because he had only got to fix the type of face in the mind of the public, and he was always certain his portraits would be recognised. Something of the same kind is done nowadays, but it is less easy, and effected only by exaggerating particular points, such as Randolph Churchill's moustache, Chamberlain's eyeglass, or Bradlaugh's upper lip. The public have at last come to be satisfied if these peculiarities as they imagine them to be are rendered, and there is a feeling of disappointment at looking at the photographs of these personages, because their points are not so exaggerated as one has been accustomed to see them. It is a positive advantage for a public man to be ugly. His ugliness is easier for the artist to draw, and easier for the public to remember. Parnell's regular features are a great drawback to him, and still worse is the habit he has, or had, of constantly altering the cut of his hair, whether on his head or his face. When an artist, in the height of the Parliamentary war over the Irish question, wanted to typify the Home Ruler, he rarely selected Parnell, but generally pitched upon Biggar, because his irregular features and peculiarity of shoulder made him more easily recognised.

But such men as these are, so to speak, "out of the hunt." Their features are part of every artist's stock in trade, and most draughtsmen can delineate them near enough without troubling to buy a photograph. The difficulty with public men is when they suddenly jump into celebrity, and before their portraits are published. How to obtain their likeness, if they happen to be unknown to the artist, is the problem to be solved. The rush after the portrait of Prince Henry of Battenburg, when this fortunate young gentleman was pitchforked from oblivion, and a lieutenancy at £80 per annum, into publicity as the affianced husband of an English princess, was something unprecedented. No one could have less expected his elevation than the lieutenant himself, for he had not made the slightest preparation to satisfy the curiosity of the public. When the betrothal was announced not a photograph was to be procured in London, and for days the feminine portion of the Engish public were kept in agonising suspense, for rumours of the extraordinary prettiness of the prince had reached us, and this was quite sufficient to create a demand for his portrait. Had the artists on the illustrated papers only had an inkling of what the prince was like, they would soon have evoked a portrait from their own imaginings. But they were without information as to whether his nose was Grecian or Roman, whether his eyebrows were arched or straight, and whether his moustache was drooping or waxed: and nothing could be done until his photograph arrived from the Continent.

The Soudan war was a time of great exasperation to the journalistic artist. It was impossible to tell what general would suddenly come to the front, and the chances were ten to one that he had been so inconsiderate as to neglect having his portrait taken before he went away. The newspaper office with which I was connected was kept in a constant state of ferment. First, it was Colonel Smith whose portrait was demanded, then it was General Brown who was in request. Messengers were dispatched in hot haste to the various photographic print dealers, to come back with the intelligence that no photographs of the hero were in the market. In despair the artist would refer to the Court Directory, find out where the relatives lived, and rush off in a hansom to the house.

Even here it was not certain his efforts would be rewarded. I remember an artist calling upon the wife of an officer whose name for a short time was in everybody's mouth. "Yes," said the lady, "I have a photograph in my album, but I would not part with it on any account." The artist assured her that he would not require it more than an hour, but all in vain. The utmost concession he could obtain was permission to look at it for a few minutes, and make a few notes. As to "squaring" it, so as to get the features absolutely correct, that was not to be thought of. The album was reluctantly produced, and the lady mounted guard, watching every movement of the artist with ill-disguised apprehension lest he should yield to a sudden temptation and appropriate the treasured portrait.

On another occasion, after the artist had been made happy by the announcement that he could have the photograph he was seeking, his hopes were dashed by the information that "we don't call this a good likeness of Colonel So-and-so now, because this was taken twelve years ago, and since then he's shaved off his beard." It is scarcely necessary to say that no one can say with any degree of accuracy what a man who has taken off his beard looks like. In this case the portrait was a leap in the dark; the artist could only take what lines he could make use of—the eyes, nose, and outline of the upper part of the face—and trust to fate for the chin.

Desperation sometimes drives a man to expedients which he would not otherwise think of. On arriving at the house of a certain Soudan hero, the artist found, to his horror, that the whole of the family was in Devonshire, and the house in charge of the servants. What was to be done? Summing up his resolution, the artist looked the footman straight in the face, jingled the money in his trousers pocket, and said boldly, "I suppose there's a photographic album in the house, isn't there?" "I believe there's one in the drawing room, sir." "Can't you let me look at it?" with another jingle of the coins. The man coughed doubtfully, stepped back a couple of yards, and glanced up the staircase. "It's all right, sir; you just wait here a moment, and I'll bring it to you." And so he did, and there, to the artist's joy, was a portrait of the man he wanted. "I was afraid of the housekeeper, sir," whispered the footman, as he pocketed five shillings. "You see I might have got into a row, because I'm certain she wouldn't have let you have a sight of the halbum."

But these are minor difficulties compared with those which I have known an artist meet when he wants the portrait of the unknown man, and has reasons not only for not asking him for his photograph, but also for concealing from him the fact that his features are being sketched. It has been my lot to have had, in company with an artist, a varied experience of this kind of thing, and in the next paper I propose to relate a few odd incidents which have happened to us during not one, but during many hunts after portraits.

(*To be continued.*)

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.*

Chapter XIV.—Lenses (*Continued*)—The "Globe" Lens—Ross's Actinic Doublets—Rapid Symmetrical Doublets of Dallmeyer and Steinheil—Diffusion of Focus.

In 1860, C. C. Harrison patented his "globe" lens, so called because the outer surfaces of the combination form part of the same sphere, as shown in figure 25. This lens is a symmetrical doublet, and the focal point of each combination is at the centre of the arrangement. It suffers much from spherical aberration and from flare.

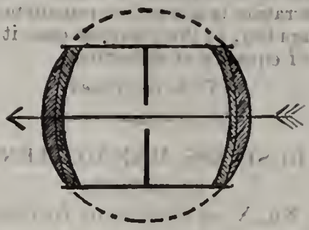

Figure 25.

In 1864, Ross's "actinic doublets" were introduced (figure 26), the first non-distorting doublet including a wide enough angle for average views that enjoyed any degree of popularity. This lens is not symmetrical, and it is free from flare. It was made in three series, rapid, medium, and wide angle, and the last pattern includes as wide an angle, probably, as any lens made before or since for use with flat plates.

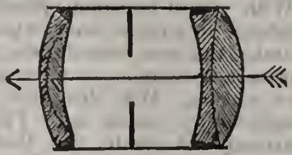

Figure 26.

C. A. Steinheil, in 1865, introduced the "periscopic" lens, a non-achromatized, symmetrical doublet, as figure 27. This lens includes an angle of 90°, and is an improvement on the "globe," being about one quarter the diameter for the same field, because the lenses are brought nearer together. This lens, however, is not free from flare, and its defining power has been much complained of. Obviously focussing cannot be done as usual with a lens not corrected for chromatic aberration, and to get over this difficulty the inventor states that no focussing is necessary, as near and distant objects are equally clear, and the plate-holder should be adjusted once for all. Deceptive statements of this sort had been made before, and so far as there is any truth in them, they apply equally to all good lenses of the same aperture and focal length. The periscopic lens was not a step forwards towards perfection.

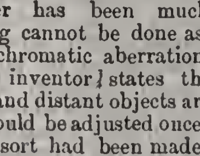

Figure 27.

In the following year, however, namely 1866, we have the second epoch in the history of photographic objectives; for just as the Petzval-Voigtlander portrait lens has been copied by every optician who caters for photographers, so has the symmetrical achromatic doublet, working at about $\frac{f}{8}$, been imitated; but with perhaps this difference, that each imitator deems it necessary to give a new name to his rapid view lens, and, so as far as he is able, to introduce it to the world as a new instrument. It was at the end of the year that J. H. Dallmeyer constructed his "rapid rectilinear," and Steinheil his "aplanats," each optician working quite independently, though simultaneously. Dallmeyer's discovery was preceded a few weeks by his wide angle rectilinear doublet, working at $\frac{f}{15}$ to $\frac{f}{17}$, which has its posterior combination of smaller size than the front combination, that its reflecting power may be diminished, and any tendency to flare reduced. See figure 28. The nature of the rapid lens is sufficiently indicated by figure 29. Steinheil also introduced a large angle aplanat, in which the combinations are of smaller diameter, thicker, and very much nearer together.

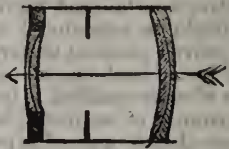

Figure 28.

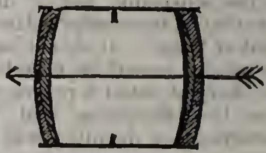

Figure 29.

The rapid rectilinear of Dallmeyer soon began to replace his triplet, but it was not till 1874 that Ross introduced his portable and rapid symmetricals, and left his actinic doublets as instruments of the past.

The apertures chosen by Dallmeyer and Steinheil, $\frac{f}{8}$ and $\frac{f}{7}$ respectively, have proved to be the most useful for the general work that such lenses are constructed for; but in January, 1870, J. H. Dallmeyer exhibited a lens of similar construction, but of aperture $\frac{f}{3}$, at the London Photographic Society, to show that by reducing the angle of view included, this form of lens could be made as rapid as the ordinary portrait lens. J. H. Dallmeyer considered, and the firm still consider, that this pattern is not the best for general portraiture. Voigtlander, however, has since then introduced two series of rapid symmetrical doublets, his "Euryscopes" working at $\frac{f}{6}$, in 1877, and his portrait "Euryscopes," with an aperture of $\frac{f}{4}$, in 1886.

At the same time that J. H. Dallmeyer obtained a patent for his wide angle rectilinear lens, 1866, he got protection for a modification of the Petzval portrait lens, in which the flint component of the separated back combination was put behind instead of in front of the crown, and the latter was a meniscus instead of a double convex. The new form is shown in figure 30. But the chief point was that the back flint might be moved backwards to a certain and exactly definite extent, thus introducing, when required, a definite and exactly reproducible amount of spherical aberration. This he called "diffusion of focus," a very good and perfectly descriptive term, although it has been much cavilled at. The principle of this innovation has also

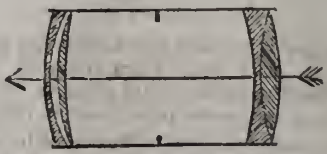

Figure 30.

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* Continued from page 604.

been very much argued against, so that it is necessary to devote a little more time to this matter than it intrinsically merits.

First, practically, the optician serves the photographer, and endeavours to supply his needs. The convenience under discussion was specifically asked for by some of the most eminent photographers; it was hailed by them, when they got it, as a "new power"; it is still employed every day by artists who know what they want, and find this a means of getting it. Before Dallmeyer introduced this form of lens, inferior instruments were sometimes much valued, because they possessed the desired property; but in such a case the effect is due to carelessness, and is uncertain and cannot be regulated. Dallmeyer gave the possibility of getting a certain and regulatable amount, and an amount that might be reproduced exactly at any time.

In spite of its proved practical utility, the principle has been denounced by at least one of our ablest opticians, besides by others who are qualified to judge of such things; giving another instance of an incomplete review of facts leading to a theory that is opposed to practice. In fig. 31, *a*, a lens of large aperture, is represented that is entirely free from spherical aberration, and the light emanating from each of the two points on the left is brought to an exact point on the other side, but at different distances from the lens, so that on the sensitive plate if one is "sharp," the other is "out of focus." It should be noted also that, in practical portraiture, something must be sharp with such a lens, or if the sharpest detail is put out of focus, the other detail will also lose sharpness, and the proportional differences of sharpness of definition will be approximately maintained.

The introduction of a little spherical aberration reduces the sharpness of the sharpest part down to the "softness" or out-of-focus effect of the rest of the image. In fig. 31, *b*, the image of the nearer point, covers no greater space on the sensitive plate than when spherical aberration was absent, while the further point gives an image that is as "diffused" as the nearer point, instead of being sharp.

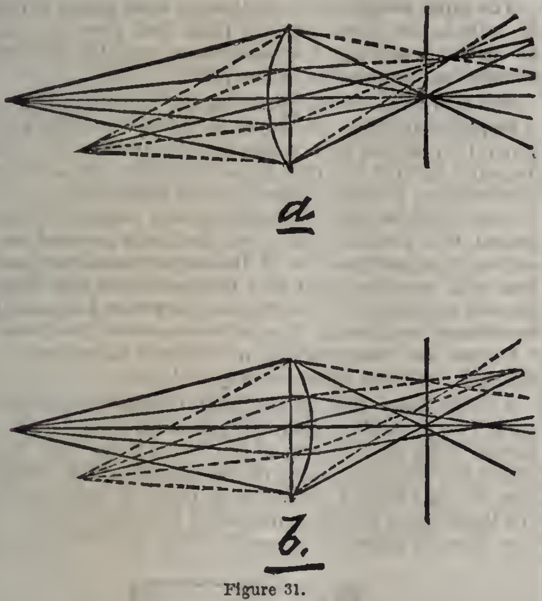

Figure 31.

The advantages of this "diffusion of focus," "depth of definition," or "lack of definition," or whatever else it may be called, were pointed out by J. Petzval in 1859, that is, by a mathematician who was neither optician nor photographer. Indeed, he gave directions for getting a useful amount of spherical aberration with his orthoscopic lens.

Spherical aberration is present in all practical forms of single lenses and in many doublets, and it is reduced to a negligible amount (that is, negligible for ordinary work) by the use of a diaphragm. The diaphragm reduces the aperture, and so lengthens the necessary exposure, but rapidity can be gained at the expense of sharpness of definition by enlarging the diaphragm, and so increasing the spherical aberration to a perhaps noticeable quantity. The larger landscape lenses of W. Wray have a maximum aperture of $\frac{f}{8}$, but with this aperture the definition is nowhere sharp, though sharp enough for large portraits. The 5 by 4 rapid doublet of the same maker is constructed with an aperture a little larger than $\frac{f}{6}$, although with this aperture there is a considerable amount of aberration. Spherical aberration is allowed to remain in these cases for the sake of rapidity, in the previous case it is introduced for the sake of equality of definition.

(*To be continued.*)

BUSINESS MANAGEMENT.

BY CRITICUS.*

No. X.—Concluding Article.

Many beautiful examples of the carbon and bromide processes on *plaques*, vases, China tea and other services, now adorn the show-rooms and more conspicuous positions of a high class portrait establishment, but we have noticed in some of them evident signs of deterioration. Doubtless the causes are of a preventible nature, still the fact remains, and a possibility of doubt about the permanence is engendered. With regard to ceramic photographs, there is plenty of evidence to sustain their reputation for durability, even under the most crucial tests, and for delicacy and beauty of result, ceramic enamels are not surpassed by any known process. Why this class of work is comparatively neglected we cannot say. The labour of production is certainly not greater than that of many other articles the price of which is not prohibitive. It is true that it would prove inconvenient to some photographers to carry on this special work themselves, but the same remark applies to enlarging. Of this we are tolerably certain, that an almost unlimited field is open to anyone who can successfully produce ceramic photographs, of any reasonable dimensions, at prices which favourably compare with those charged for well-finished opalotypes, and we know of nothing better suited for making an excellent show. Take, for example, the large glass case exhibited on one of the tables at the Pall Mall Exhibition this season. The producers of these exquisite specimens no doubt realise high prices for their work; but, should a demand occur, the process can be carried on at a very moderate cost.

The importance of a tastefully arranged display of good work in photographers' specimen frames, or shop windows, as the case may be, for the purpose of attracting attention and introducing clients, has been alluded to in former articles; but nothing has yet been said about the hours these specimens should be exposed to public gaze. The familiar plan of closing shops now so generally adopted by jewellers and others—namely, that of securing their windows from damage by means of iron gates, instead of the more old-fashioned shutter, appears to us to offer the most satisfactory arrangement for protecting the exhibits after the usual hours of business. Already we know of several photographers who have adopted the method, which seems to be beneficial, since it enables many persons who may be desirous of, and feel interested in, examining the specimens—but whose leisure in many cases is strictly limited during the daytime—to choose an opportunity for the purpose best suited to themselves. As few establishments commence the day's toil before nine o'clock in the morning at any period of the year, and closing time may be said to range from five to seven o'clock in the evening, no advantage would be gained by a general determination among proprietors to start earlier than the hour mentioned, for sittings are seldom required until ten o'clock or after. In suburban neighbourhoods, photographic businesses are sometimes kept open later than seven o'clock, either for the reason that evening sittings are given, or that the clerk in charge may answer questions, take orders, sell photographs, frames, and book sittings; but in a general way, the practice would scarcely justify the expenditure involved by the tax of longer hours upon employées and employer alike.

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* Continued from page 615.

Those whose duty it is to receive clients or other visitors bent upon inquiry should be possessed of business tact, and able to profit by shallow and hackneyed observations, such as "I would rather go to the dentist's," "I make a horrid photo.," "I will never be taken again," &c. Remarks of this kind are very trying to the temper, owing to their frequent repetition, but they may be skilfully turned to account by a practical hand without resorting to untruthfulness, excessive flattery, or deceit. Persons prone to use the expressions referred to will most assuredly repeat them to everyone about the premises with whom they may come in contact, therefore it is the duty of the manager to instruct those about him to reply in suitable terms.

As a hint to beginners, we may say that annoyance is often given in the studio by the photographer requesting his patron to look more pleasant, &c. It is possible to arrive at the desired result, however, in a less abrupt manner. Over-pleasant expressions do not satisfy everybody, especially when it happens that in relaxing the facial muscles, the mouth partially opens and displays too many teeth, which means a re-sitting, or unpleasantness with the customer. We strongly deprecate the system of gratis re-sittings, and think a small charge should always be made, even though the fee be insufficient to defray the cost of material, incidental expenses, and time. When it is known that re-sittings may be had without extra charge, some people exhibit so little consideration for others that they do not hesitate to be taken over and over again in different costumes and positions, and finally remain away altogether, taking no notice of the photographer's repeated applications to give him an order. Others, out of compassion for the trouble they admit they have given, tender a commission so insignificant, that it would have been much better had they stayed away. When the matter of re-sittings is properly represented, few persons will object to pay a small charge for the privilege of being re-taken if desired, and they soon find out when they have had enough of it. The custom of submitting proofs has now become so general, that in starting a new business it would be an essential condition. Many houses are content with sending an untoned print enclosed in a non-actinic envelope, upon the outside of which instructions are given to examine the proof in a feeble light. This plan has one distinct advantage, viz., the unfinished photograph has no value whatever after the first day or two, whereas if it were toned and fixed, a difficulty might arise in getting it returned. Upon the whole, we should prefer to encounter that difficulty, not only for the reason that a clearer indication of what the photographs will be is conveyed to a non-technical client, but any chances of misconception due to the darkening action of an untoned print is thereby removed.

Photographs of celebrities, and views possessing local interest, often fail to yield sufficient profit to make the negatives exceptionally valuable, still it is advisable to secure the copyright of the best of them, which can be done at a trifling cost.

A printed form is obtainable at Stationers' Hall, on which the following particulars must be clearly stated:—

Description of work, accompanied by an unmounted copy for attaching to the form.

Date of agreement or assignment.

Names of parties to agreement or assigment. The document relating to assignment should be produced when form is returned. It may be briefly drawn thus:—This is to certify that I, A——, assign all the right of copyright to C——, Photographer, of ——, this —— day of —— 18——. Signed, ——.

Name and place of abode of proprietor of copyright.

Name and place of abode of author of work. This must be the actual maker of the negative, whether an assistant or the proprietor.

These particulars appended, the form must be personally deposited by the party claiming copyright—or his agent—together with a registration fee of one shilling with the registering officer appointed by the Stationers' Company, who will give a printed acknowledgment for the same. Copyright in a photograph cannot be obtained by letter, but certain agents undertake to register any photograph sent to their office with the necessary particulars, and eighteen penny stamps. We do not regard the copyright law as at present administered to protect a photographer's productions from piracy to an appreciable extent; perhaps other Acts of Parliament also fail in their intention as well; still, the small outlay required to register a photograph may prove to be a cheap form of advertisement, if nothing else; besides, it deters some persons from copying a photograph if they see the word "copyright" stamped upon is—that is, if they have anything to lose. Portraits of Royalty, statesmen, and other notables, State processions, and the like, are usually looked upon as very good property; such photographs may be published, but the magnitude of the sales, of course, depends a good deal upon the popularity of the persons or places represented. This, however, may be largely increased by seeking out the best retail channels for the disposal of the goods. As a rule, photographers who are accustomed to the publishing trade are acquainted with the best means of distribution, and possess special facilities for bringing that about. As may be expected, the principal firms do not care to publish an inferior photograph, since it would affect their reputation, and interfere with future business; indeed, the high standard of excellence shown in the majority of the specimens of published work is sufficient evidence that less skilful productions would not be accepted, for now-a-days the public, who are the purchasers, can, and most assuredly do, recognise merit in a photograph.

A publisher's stock of photographs is usually large and varied, in order that all reasonably expected demands may be met with promptitude. This acquired and constantly-increasing stock necessitates the use of more capital than the majority of other photographic pursuits; moreover, no inconsiderable expense is entailed in the manipulation of such a business, especially as regards introducing new subjects. All the large houses in the trade have travelling agents busily engaged along the more important commercial routes, whose duty it is to bring under notice of retailers the subjects their pattern-books contain. By means similar to this, sharp canvassers who represent well-known firms seldom fail in any district to book orders, and sometimes the extent of these would appear to the uninitiated incredible. Such are the principal conditions under which a wide distribution of a special photograph is obtained, and it will be readily understood that the difficulties in the way of disposing of, perhaps, thousands of copies of a particular subject, are such that the ordinary portrait photographer would hardly care to encounter. It would suit his purpose better to make the best terms he can with some well-known publisher, who will, if there is a reasonable probability of a demand, give him an order for prints.

It is scarcely within our province to deal with the wholesale price paid for the work, as that is a matter for private contract; but we may mention, as an indication of what may be expected, that photographs of cabinet size in London realise from forty-eight to sixty shillings per gross. The purchaser then defrays all costs of, and incidental to, supplying retailers with the goods. As these latter buy this size photograph at seven shillings per dozen, or thereabouts, subject to a discount, and possibly a long credit, it follows that unless a photographer desirous of publishing has numerous samples of goods, illustrating all sorts and sizes of saleable subjects to introduce, and the means of supplying the demand when created, he is very likely to fail. Furthermore, he may lose the sale of an enormous number of prints which the recognised publishing firms might otherwise have negotiated for. Well-executed photographs of choice or exceptionally interesting subjects, quoted at low prices, long credits, or heavy disconuts, and goods upon sale or return, are features to be met with in the publishing trade; therefore it need not be a matter of surprise that negatives possessed of some interest when offered for sale for the purposes of publication do not realize the sum very often anticipated. Few negatives are likely to fetch the price paid for Watkins' negative of the Prince of Wales in Masonic costume, which was knocked down under the hammer for £180: and we have heard, upon very good authority, that the firm who purchased were well satisfied with their bargain.

To be successful as a photographic publisher necessitates the possession of business capacity, combined with an extensive acquaintance with the market, and the means of supplying it upon the most favourable terms.

Before closing the series, there is one other suggestion we desire to offer, and that is to apply the method of mounting silver prints optically in contact with convex glass to ordinary portraits. The process is simple and inexpensive, and when the photographs are suitably framed with plain or ornamental metal rims, a ready means of improving the exchequer is afforded.

This series of articles has now exceeded the limit originally intended, and it is doubtless true that much could be added before they would become thoroughly comprehensive; but it was not the object to write a book upon "Business Management." Our task was to point out the main features bearing upon the business of photography, together with such minor details as appeared to us likely to be of use to a technically proficient worker. In this our attempt to deal with a subject capable of being judged from so many aspects, it is scarcely to be expected that the views embodied therein have been endorsed by all who have done us the honour to peruse the series. Our object will have been attained, however, if a few only of the readers are led to achieve a larger measure of success by the lines indicated, than might have occurred had they remained unwritten.

THE EXHIBITION OF THE BOMBAY AMATEUR PHOTOGRAPHIC SOCIETY.

On page 612 of our issue of the 30th ult., we gave an extract from the *Times* of India having reference to the above-mentioned Society, and we now quote some remarks from the *Bombay Gazette* regarding the Exhibition, and the soirée which preceded it.

The *Bombay Gazette* says:—

> At the conversazione which preceded the opening of the Exhibition yesterday, Dr. Wellington Gray, the president of the Bombay Amateur Photographic Society, asked for the indulgence of the spectators in judging the pictures. The work of the amateur votary of any art is always considered a subject rather for encouragement than for censure, and the critic who would frown upon any shortcomings he may detect in the work of a professional who has made a particular calling the business of his life, relaxes the standard of his judgment a great deal in favour of the man who follows an art as a pleasure and a recreation. But taken as a whole, we believe that the large collection of photographs which is exhibited at the Framji Cowasji Institute will merit the approval, in something more than a conventional sense, of the artist's discerning eye. When there are so many as 300 exhibits, and all of them by amateurs, it goes without saying that some of them should be of very indifferent merit. But we do not think it will be denied that the general standard of excellence is high, and the value of whatever commendation that may be bestowed on that account is heightened by the fact that the Society which has organized the exhibition, the first of its kind in India, is not yet a year old. The committee had to select the exhibits from a very large number of aspirants to a place on the walls, and it is due to their judicious labours in the cause of the survival of the fittest that we find here an entire absence of specimens executed by the merest tyro. The Society numbers about sixty members at present; but we should not be surprised if one result of this exhibition were to draw many recruits to its ranks; for there are many pictures exhibited here which may serve to bring home to one's mind the pleasures of photography. Numerous improvements have from time to time been introduced in photography, and while the beginner in these days has the good fortune to learn the art at a time when it has already reached an advanced state of perfection, he may hope to see before very long still more noteworthy improvements. Colour photography, for instance, may be said to be still a thing of the future. Many have applied their minds to discover the process, and the man who succeeds in making this discovery will certainly mark an era in the progress of this art.
>
> Where most of the pictures displayed an almost equal degree of merit, the judges had not an easy task before them of selecting the best three for the gold, silver, and bronze medals offered by the Society. The judges were Mr. A. K. Oliver, Mr. Rienzi Walton, and Mr. M. Fisher, and the way in which they have performed their duty will deserve general approval. They however occasionally discovered points of merit which were invisible to the eye of the exhibitor, and in one instance, at any rate, they awarded a medal for a landscape photo which had been contemptuously flung aside by the artist, and subsequently sent in to fill up a gap! Modesty is ever blind to its own good qualities. The judges have offered the gold medal to Mr. George Ewing, a member of the Photographic Society of India, who has exhibited some beautiful transcript scenery from Simla. The harmony of light and shade is admirably preserved, every outline of the dwellings standing on the mountain slope is clearly brought out, and the colour of the sky and of the range of mountains in the hazy distance is represented with admirable fidelity. Another photo, called "The View at Simla," is a very pretty piece of scenery, wild and grand. Dr. Wellington Gray carried off the silver medal. He is one of the comparatively few artists among the competitors who have paid attention to objects of local interest. His studies comprise bits of landscape from the Victoria Gardens, the Vehar Lake, and "a newly discovered island," in the last of which the effect of the reflection of trees in the water is beautiful. Mr. E. Ferres Nicholson also exhibited several scenes of local interest, taken by the instantaneous process, such as the Apollo Bunder on a mail day, the Walkeshwar Tank, and Pydhonee. We see a vivid representation of the Bunder, with view of the shipping in the harbour; and the busy quarter of Pydhonee, with its temples and buildings in all their grotesque variety; the coming and going of men and carriages is represented admirably well, every feature of the scene, including the tramway lines, having been distinctly brought out. Mr. Nicholson has well entitled himself to the bronze medal which has been awarded to him. A prize had been offered to the best man among those competitors who were of less than a year's standing, and, perhaps, none will dispute the judges' award in this case in favour of Mr. H. Bromley. From the number and variety of pictures exhibited by him, he seems to be an enthusiastic student, and the work he has shown is very creditable for a beginner. His "Bombay Fishermen," and a view of the Apollo Bunder showing grand preparations made for the reception of some distinguished personage, are among the specimens which give promise of future excellence. Mr. G. G. Craig, the honorary secretary of the Society, has contributed a number of landscapes and portraits of great merit. He has commemorated the Jubilee arch erected at Colaba, has taken a very good photo of the Mahim Woods with a very lightly clad native sitting in the midst of the palm trees, and has given an admirable representation of the group of magnificent buildings standing in the vicinity of the Rajabai Clock Tower. Mr. Craig has also contributed some comical sketches. "Caught Photographing" is an ingenious piece of fancy. Then there is Uncle Booth exercising his bald head over the intricacies of the New Municipal Bill. His "Questionable Characters" shows a couple of villains meditating some dark deed. Mr. H. O'Connor has also contri-

buted to the comic side of the exhibition in his picture exhibiting many varieties of facial distortions. One of his best exhibits is "Our Ruth," in whom many will recognize Lady Morland's representation of the character by that name in the "Pirates of Penzance." As we have already stated in our preliminary notice, landscapes form the greater number of the exhibits; but portraits were by no means neglected, and this branch of study had one of its principal exponents in Dr. Hojel, whose studies of human heads and figures were "highly commended." The same artist has also displayed some antiquarian interest by his studies of some of the celebrated ruins of Bijapur, and one may recognize among them with little difficulty the renowned Gol Gumbaz, the frontage of the Meheturi Mehel, and the ancient gun bearing the proud name of Mulki Maidan, or the Monarch of the Plain. Dr. Cook gives some striking scenes of Poona, Mahableshwar, and Matheran; and Mr. T. M. Fernandez has turned his experience of the Mofussil to account by contributing studies of the Dutch tombs at Surat, some of the well-known mosques and shrines of Ahmedabad, Shrawak priests, and a little faquir lad. Though Mr. W. E. Mulock has not entered himself as a competitor, he has sent a number of shikar photographs, some of which no doubt represent stirring incidents of hunting which have come within the personal experience of this enthusiastic sportsman. The only natives who have competed at this exhibition are Dr. Kurtikar and Mr. K. Naegamvala, the latter of whom contributes a number of interesting micro-photographs.

In this rapid survey of the Exhibition, we have necessarily omitted several names which deserve honourable mention. Of these there are not a few who are members of the Photographic Society of India, and the compliment which they have paid to the local Society by sending their photos here for competition will be paid back by the Bombay amateurs in a similar manner when a photographic exhibition will be opened in Calcutta during the next cold weather.

Notes.

Perhaps a little more crowded than usual, but without any notably fresh feature, the Photographic Exhibition *soirée* passed off on Saturday evening last.

Some amusement was created by the fact that a lens tube to which was fitted a diaphragm arrangement, for exhibition, was chained to the apparatus table by the special request of the exhibitors, J. and R. Beck.

It was rumoured that a lens disappeared from the apparatus table during a former exhibition; but even if it is true that the lens did disappear, and, moreover, if the lens was really stolen, and supposing that the unhappy individual who stole it still frequents the exhibition room for the purpose of illicitly enriching himself, it is probable that he would not think it worth while to purloin the lens mount—a mere piece of odd brass work, absolutely without selling value, and which would cost far more to adapt to a lens than the equivalent of any advantage to be gained.

Toft's bust of the President was well placed in the Gallery, and much admired.

"Wire judges' decision," and "Have I got a medal?" were, as usual, the substance of several telegrams received by the assistant secretary during the evening; but neither these telegrams nor the endeavours of the ardent exhibitor to drag one from corner to corner to "see my bit" were much regarded by anybody.

No. 268, "Scenes from David Garrick," taken by John F. Roberts in the light of ordinary gas burners, richly deserves the medal awarded to it—in fact, we spoke of the merits of this series some months ago; but were it not for the fact that the Photographic Society is in constant hot water about its rules, and, indeed, so seldom conforms to its own Exhibition rules, we should feel surprise that a series of pictures which have been so largely exhibited in London should be admitted into the Exhibition. Mr. Roberts' series has been used freely for months past as a theatrical advertisement in the public-houses and other resorts of London.

An artistic "show," which promises to be the talk of London, will open on Monday, at the Grosvenor Gallery, which has been transformed for the purpose. This is the exhibition of the pictures of the Russian painter Verestchagin, who, as an exponent of realism in art, is as unflinching and as uncompromising as Zola is in literature. The majority of the pictures treat of incidents in the last Russo-Turkish war, and nearly every one is a revelation of the horrors of the battle-field set down with naked fidelity. Some of the representations will be photographic reproductions, the originals being in a museum at Moscow which has been built for their reception. As one of these pictures represents an incident in the Central Asian campaign, wherein the Emir is inspecting a heap of human heads, perhaps it is as well that the English public should see it only as a photograph.

A curious case of the perpetrators of a robbery being brought to justice by means of a photograph has just come under our notice. Some time ago, a person strolling in a wood near a small town in Devonshire sat down to read a book. While so engaged, he was set upon by a couple of tramps, who, after garrotting and otherwise ill-using him, went off with several pounds, a gold watch, and a photograph of his wife. He was found several hours afterwards lying perfectly insensible, and when he recovered consciousness, was quite unable to describe his assailants, whom, indeed, he had hardly seen. The fellows would have escaped but for the fact that they had preserved the photograph. This was found in the possession of one of two men suspected, and though not a farthing of the money nor the watch was found, the evidence of the photograph was considered good enough to convict them.

The King of the Belgians is utilizing photography in the improvement of street architecture in Belgium. With this end in view, he spent several days in inspecting the various styles adopted in Eastbourne, and has ordered photographs of those which pleased him, together with the names of the architects and builders, to be forwarded to him. It is to be hoped that he has not entrusted this commission to a house agent, who somehow has the knack of always getting hold of slovenly and inferior photographs. Is it a question of price which makes the average photograph put forward by the house agent and auctioneer so very bad?

We quote from the *Times* an example of the ingenuity of criminals in avoiding identification by photograph. The police authorities at Scotland Yard have in their possession a series of sixty photographs of one and the same German girl—a most notorious offender. But so different are the dress, the look, the expression, and the whole appearance of the subject of these photographs, that the most clever detective might readily be imposed upon, and fail to recognise the identity.

A correspondent of the *Globe* says "the fact that countenances continually repeat themselves is a very strong argument against photography as a means of identification." That countenances do repeat themselves up to a certain point is quite true, but we are inclined to think that what difference there is between two faces which are supposed to be alike is often made evident by photography. The cases of mistaken identity referred to by the correspondent prove nothing against photography, because in both instances it was a question of the retentiveness of the detective's memory.

It is perfectly true, as this correspondent points out, that in England, of the photographs taken in gaols the majority are in every way badly done, and a constable may spend a day or more in searching through the collection for a photograph with nothing to guide him but his recollection of a man's face. As to the quality of the photographs there are exceptions, and notably in the case of Mr. S. G. Payne, whose remarkable series of criminals' heads, taken in Aylesbury Gaol, is pretty certain to attract attention from the visitors to the Pall Mall Exhibition. On the whole it would seem that for purposes of identification neither photography or anthropometry is absolutely trustworthy by itself, but that a satisfactory result is only to be found in a combination of the two.

The *Athenæum* last week indulged in a sneer at photography. In a preliminary notice of an Art Exhibition to be held at Derby, in December, it says, "To a third section competitors of all kinds, lay and professional, will be admitted. To this last class 'artists in hair,' 'paper-painters,' 'artists in shell work,' and we suppose 'photographic artists' will, it seems, be welcomed." Whatever the "photographic artist" may have been in years gone by, he no longer exists. The photographer, whether professional or amateur, is quite content to be known by the simple name of "photographer," and to have his knowledge of or taste for art guaged by what he produces. Some artists, not photographers, whom we have known, have opposite views. They are quite contented to be called artists, let their productions be anything but artistic.

It was not likely that Professor Herkomer, as an engraver, would have much to say in favour of photogravure. He writes that "The Printsellers' Association," to whose doings we alluded last week, has lowered its standard considerably by stamping photogravures. He goes on to say that "the horribly lifeless mechanical style of engraving that followed upon Cousins's excellent work has caused printers to rush to anything where the human hand is left out for the reproduction of their work," and follows this up with the opinion that "the human hand has to do much doctoring to a photogravure plate before it is fit to be seen—worse luck." Is it not rather contradictory, first to find fault with photogravure because it is not done by hand, and then to complain because hand labour is applied to it? Herkomer calls this hand labour "doctoring," but how much "doctoring" is done to an etched plate, and how many proofs are pulled before it satisfies the etcher?

Some particulars as to the excellent work and satisfactory progress of the Camera Club will be found in a circular issued by the club and reprinted on p. 626; and the following Thursday evening meetings are announced:—October 13, at 8 p.m.—Lyonel Clark—"The Selection of Lenses." October 20, 8 p.m.—Lantern evening. W. Brooks will show a series of lantern transparencies of interiors of Windsor Castle. Members are invited to bring slides. October 27, 8 p.m.—Dr. G. Lindsay Johnson—"The Practical Testing of Photographic Lenses." Members are invited to bring lenses to be tested.

We cannot vouch for the truth of the rumour—for nothing official has been stated—that the Camera Club intends to organize a spring Photographic Exhibition, to open in May at the same time as the Royal Academy, but even if the committee should have definitely determined on this step, we can hardly expect arrangements to be made in time for an exhibition next spring.

A representative amateur exhibiton ought to probably prove a decided success, if organised with the same good judgment which is exercised in the present management of the Camera Club; and such an exhibition would in no way interfere with the legitimate function of the autumn exhibition of the Photographic Society of Great Britain—an exhibition in which photography by professional workers is a main feature, if not the preponderating element.

It does not follow that because the Camera Club is essentially an amateur association that photographs by professional photographers would be altogether excluded from its exhibition, but one may pretty confidently predict that the ordinary compound portrait of the show case, a photograph in name, but really an incongruous mixture of photography and handicraftmanship, would not be accepted.

A curious rumour comes from Paris as to the—well, we will not say "base," but improper "uses" to which photography is being turned. A few weeks ago, it will be remembered, the French capital was startled one evening by the publication in full of the scheme for the secret and sudden mobilization of an Army Corps on which the War Office had decided. The Government was naturally concerned at the betrayal of its plans, and there was nearly as much stir and outcry as when C. Marvin earned ephemeral fame in this country by furnishing the

Globe with a copy of the Salisbury-Schouvaloff "secret treaty." How any one could have found time to copy a document of such length and so full of details as the mobilization scheme was what the French War Office authorities could not make out, seeing that no subordinate had ever had the original document in his possession long enough to copy it. But the rumour we have mentioned claims to have solved the mystery. The mobilization scheme was photographed, it is now asserted, by an employé to whose hands it was confided.

Now this statement, if true, may perhaps help to explain some of the other recent cases in which confidential documents have prematurely found their way into the newspapers; the pocket camera has possibly been at work. At all events, Government will have to be on their guard against the use of it in future. Granted an opportunity —and where there's a will there's a way—it would surely be in the power of an individual whose photographic ability was of a higher class than his principles, to secure, say, a passing "shot" (in a strictly professional sense, of course) at the plans of a new ironclad, or the working-drawings of a just-invented torpedo, or the MS. of a confidential minute of some great Minister of State or Governmental Board. For it must be remembered that these stolen photographs would often be worth such large sums, that the operator who secured them would be exceedingly well paid for any risks that he ran.

The cutter-out of silhouettes is not yet extinct. One of these artistic gentlemen the other day accosted a group of three—two artists and a photographer—who were having lunch at the buffet of a restaurant. Just to encourage their struggling colleague, each gave him a sitting. The artist was most expeditious. With one cut the head and hat were produced; with another the bust appeared. Dipping his forefinger into a little ticket pocket, he withdrew it, having a dab of paste at the tip. Presto! the head and bust were stuck on a piece of paper, a portion of which, being left between the two portions of black, forthwith became a collar of brilliant whiteness. It was finished, and all for twopence. "Why," exclaimed the photographer, "this must pay better than photography." "Well, sir, it does and it doesn't; it all depends. I'm an old photographer myself—can go right back to Daguerreotype. But photography isn't what it was, and so I went into silhouettes. I did very well at the Aquarium until they wanted rent of me. I couldn't make a living out of it then. What does best in photography is a travelling caravan; always get customers on market days and fair times. Make four or five pounds a week easy. Yes, sir, that's what I should go in for if I had the money to start with. Have your portraits bronzed? Only a penny more." The sitters consented to be "bronzed," and the artist made a few scratches with an aniline pencil, the strokes, when held in the right light, taking a colour which, by an effort of the imagination, might pass for bronze. The silhouettes were not particularly good portraits; but what can be expected for threepence? Silhouette work cannot be very remunerative, and no wonder the artist sighed for a photographic caravan, with its free life and no rent or taxes.

A WEEK WITH A CAMERA.

Rather short was my experience. Only a week!—but long enough to have killed a whole family. My camera certainly has been the cause of making me at variance with the whole neighbourhood in which I reside. Those about to learn photography should lay seriously to heart *Punch's* advice to those about to marry—"Don't!" But to relate. I caught the infection from a friend, immediately rushed home, talked my wife over, and sent forthwith to London for a "complete apparatus." After I had passed several sleepless nights, it came. Next day was Sunday, and, sad to relate, the whole day was hopelessly spent in trying to make the stupid box stand upright on its three legs. There was something very mysterious about those legs. They seemed clandestinely leagued together to cause all the annoyance possible. Towards morning I had fairly mastered them.

Then the bedroom was turned into a temporary "dark room," and this led to an unavoidable battle with my wife. Then strange compounds had to be mixed, and for several hours I worked hard as a dispenser, stocking bottles, dissolving solids, and measuring out offensive smelling fluids.

Unfortunately, my wife's aunt was staying at our house at the time—an aged lady, from whom some day we expected great things. In the middle of the ensuing night there was a terrible scene. A loud scream prefaced the storm from the old lady's bedroom. My wife was soon by her side. Then I had to fetch the doctor. Nothing would turn the old lady from the opinion but that she was poisoned. Quite vividly she remembered having drunk some cold tea out of a jug in which I had mixed some filthy decoction, and which I had forgotten to wash. My wife upbraided me as the murderer of her dear aunt. Then they both fell to tears, and raised the whole neighbourhood. Meanwhile, the doctor appeared on the scene, and after he had assured her that she was only suffering from a severe bilious attack, peace was restored. Next morning the old lady was all right save a headache.

After dinner I proposed to take her portrait. She readily agreed, and two whole hours did the old lady take in "titivating herself up."

Our back premises, unfortunately, were very cramped—an evil of necessity in a large town.

I placed her in as romantic a nook as possible, and then proceeded to focus. Naturally I was greatly excited. It was my first picture. The old lady put on a most benign smile.

Her face and figure covering the whole of the ground glass, I asked her very politely to step just a little back. My head, of course, was under the dark cloth, and the whole of my attention was engrossed with the focussing. Still, the picture was not yet to my mind.

"Aunt, kindly step two or three yards farther back, please," I said, politely.

The old lady obeyed orders, and scarcely were the words out of my mouth than there was heard a heart-piercing yell, a tremendous splash, the picture disappeared suddenly from the ground-glass, and a loud scream from one of our bedroom windows told me all too plainly that something most fearful had happened.

I threw the dark cloth hurriedly off my head, and to my great consternation, beheld the figure of my revered aunt *head downwards in the soft-water tub.*

There was no more photography that day, I can assure you; and the day after my aunt left the house with anything but a smile on her face. My wife vows that all our hopes are shattered in that direction now. But then she was always a pessimist.

In spite of these mishaps, my photographic ardour was yet undamped. The whole of the third day was spent in trying to photograph my wife.

I "took her" in all manner of postures. She sat down—she stood up—she smiled—she looked sad—she posed as a "reverie" —five times she changed her dress.

All night, and several hours of early morn, were spent in developing.

Nothing came on the first plate—nothing on the second—nothing on the third—in fact, nothing on any of them save one, on which flashed up a horrible abomination.

I blamed my wife—I anathematized my camera—I cursed the man who sold it—I jumped on all the plates, grinding them to powder in my rage, and finally felt sorely tempted to swallow every drachm of chemical solution from sheer annoyance.

Then my wife abused me. Did I think we were made of money? Was I aware the stair-carpet was spoiled, and other things, besides stains of abomination everywhere? Did I forget that we did not keep a servant?—and the sooner we had one the better, if I were going to tumble a bucket of water down stairs every day.

In spite of all opposition, however, I nobly resolved to persevere. Photography was a great art, and the difficulties surrounding it only enhanced its charms.

This time I proposed taking a view from my bedroom window. I wanted to try my "snap-shutter." The particular window in question overlooked several neighbours' gardens. Just as I was preparing to "shoot," I noticed a love scene being enacted at the bottom end of one of the garden walls.

A neighbour's son, a fast young man of twenty, was indulging in a flirtation with a domestic next door, over the garden wall.

So far they had not noticed me. I focussed them very carefully. I drew out my dark slide, I adjusted my shutter, and just as I snapped the scene off, as luck had it, the bold young man took a surreptitious kiss.

I hastened to my developing room, and for the first time I was successful. Would that it had been otherwise! Unthinkingly, proud of my cleverness, I distributed prints right and left. Some cruelly-disposed person wickedly exhibited one of the prints to the young man's father. Then ensued an awful row. The whole neighbourhood was disturbed, both my eyes were blacked by that impudent young rascal, and, to crown all my misfortunes, my landlord gave me notice. He said that I was a nuisance to the whole neighbourhood.

A pawnbroker has my wretched camera, and woe to the luckless purchaser!—*Scraps.*

PRESS OPINIONS OF THE PHOTOGRAPHIC EXHIBITION.

THE following is from the news columns of Wednesday's issue of the *Standard*:—

The Photographic Society is holding its annual show at the rooms of the Royal Society of Painters in Water Colours, in Pall Mall East. The Exhibition will of course chiefly interest photographers, amateur and professional. These, we mean, will best know how to study it, and what to learn from it. As a picture show it cannot profess, and does not claim, to count. Its value is chiefly technical. But a certain number of persons among the general public will find in it one or two features worthy their attention. They will note, we suppose, that, year by year, photography from life, on a very great scale, becomes less impossible—its results less undesirable. Mr. Byrne, in No. 283, has taken some life-size heads. Necessarily a little faulty as pictures, they are yet wonderful records. In No. 184, on a somewhat smaller scale, the same photographer is more obviously successful; but then the Princesse Hélène d'Orléans—the Comte de Paris's daughter—is a very attractive theme. In frame No. 547—especially in the print of what we take to be Whitby Harbour—a justly-approved operator, Mr. Sutcliffe, again commends himself to notice. What it is difficult to retain, yet most desirable to retain, in photography after pictures is the proper relation of part to part. This is a matter in which great improvement is to be noted—the result, no doubt, of a more scientific study of the business. The Autotype Company, and Messrs. Boussod, Valadon, and Company (see in particular No. 385), and Mr. Dixon, are conspicuously successful in this department of their work. So are one or two other photographers who do not exhibit. No. 9 is a photograph not from a picture, but from objects of still life—a vase and flowers. The texture and definition here obtained appear to us quite extraordinary. The photograph is by Mr. Stevens. Seventeen medals have been awarded this year to exhibitors. In awarding them, regard seems to have been had not only to technical excellence, but likewise to the skill shown in posing the model or composing the subject. This is, of course, reasonable; but to weigh adequately the claims of the different kinds, not the different degrees, of merit must have been difficult. How would it be to award, quite distinctly, medals for the virtues of composition and for technical excellence?

A leader of the same number of the *Standard* contains the following:—

The visitor who wanders through the rooms in Pall Mall, hung with specimens of every artistic, scientific, or commercial application of sun-picturing, and strewn with apparatus of the most ingenious description, has some difficulty in realising that he is witnessing the triumphs of an invention which began within the memory of men now only middle-aged, and attained nothing like its present perfection until times so recent that we can all recall them. In the Exhibition in Pall Mall there are no signs of crudeness to our eyes. Yet crude, no doubt, and ludicrously imperfect, will to-day's performances seem to the photographers of a decade hence. But we, who lack the power of prying into futurity, may well regard these proofs of the industry and ingenuity of the last thirty or forty years with a pride unchastened by the dread of its being premature. Not only are the pictures fairly deserving of the misused title of "artistic," but even the mechanical processes by which they have been produced show an advance on what we used to witness, demonstrating the technical skill which is at the service of the art. The old process of printing on albumenised paper rendered sensitive by a salt of silver, still holds its own as one of the neatest of methods whereby negatives can be multiplied into positives. But the platinotype runs it closely, and now the direct printing on gelatino-bromide paper is likely to become a rival to the best of the old plans. When the local photographer first made his appearance, his ambition was to imitate the painter's conventionalities. His sitters were lay figures—stiff as tobacconists' signs. They sat or stood by a marble pillar, with a window curtain in the rear, and had either their forefingers in a "property" volume, or, after the ancient fashion of the painted portrait, pointed menacingly to a pile of correspondence on the table. Nothing like this appears in Pall Mall. Even the "photographic face"—the wooden smirk, or the frozen glare—seems to be a thing of the past, instantaneous plates rendering a sitting no longer the torture it used to be in a day of three-minute exposures. There are portraits of people as natural as in life, and *tableaux vivants* which form pictures in the strictest meaning of the term. The landscapes are, in many instances, even better than the figure groups, for the difficulty of getting the lights and shadows have often been admirably overcome.

In the *Times* of Monday is a long article evidently written by a well-qualified expert, and of which the following is the portion most calculated to interest our readers:—

The landscapes generally are certainly not above the average; perhaps they are even a little below it. Mr. Tolley's view of a bit of cliff and shore, with its single solitary figure, is perhaps the best; but Messrs. Pettitt's and Green's views of the Lake District are both very good. The atmospheric effect in two of the latter gentleman's views is very finely rendered. There are other landscapes nearly as good as the medalled pictures, but certainly none better. Without much question, the finest portrait in the exhibition is the head of Mr. Perigal shown by Mr. Mendelssohn, who, as one of the judges, could not receive a medal. Mr. Byrne's prize medal portrait, a life-size head, is fine, but two other portraits in the same frame certainly make the spectator doubtful of the advantage of taking these big heads life-size. The other medal for a portrait goes to Mr. Müller for a pleasing half-length figure of a lady. The series of studies for which a medal has been given to Mr. Sutcliffe includes some of the best work in the gallery. They are small landscapes with figures; in two of them singularly beautiful clouds effects are given. Mr. Robinson is well known as one of the most skilful of those photographers who devote themselves to the composition of pictures by photography, either by introducing specially dressed models into a suitable scene, and thus arranging a picture which is photographed as a whole, or by taking separate negatives which in the process of printing are skilfully combined into a single picture. His picture this year of a couple of country girls following a path over a moor, with sheep grazing in the background, is very pleasing at first sight, but a closer inspection raises questions of perspective and lighting in different parts of the picture which detract from its artistic value. Mr. Emerson's "Poacher," a study of a single figure, shows a certain artistic sentiment, but is not very attractive. Mr. Wellington's frame of various small pictures has been fortunate in catching the eye of the judges among so many others of a similar character and excellence. The medal awarded to Mr. Hyslop for his yatchts is thoroughly well bestowed. So much excellence has been attained in this line of work that it is difficult to see where there would be room for improvement, but Mr. Hyslop has succeeded in giving an appearance of life and motion to his yachts that has perhaps never previously been shown. This is due to the fact that the vessels are taken broadside on, when they are passing before the camera with the greatest apparent motion. As a rule, objects in rapid motion are taken when crossing the line of sight at a slight angle, and their motion in the field of view is consequently less. Mr. Hyslop's yachts were, it is understood, taken from a steamer running alongside them, and consequently the difference of motion between the camera itself and the object photographed was probably not very great. The same exhibitor shows some views of the yacht *Thistle*, which are not quite so good, but are interesting just now. Mr. Roberts' theatrical scenes taken by gaslight receive a medal on account of the technical difficulties attending such work, and a similar reason must be assumed to justify the medal for Mr. Cartland's picture of the performing elephants at Olympia. Among the pictures which have not been noticed by the judges are some which might well have deserved such a distinction. The most interesting series of photographs in the exhibition is the collection of views in New Guinea by Mr. Lindt. These must be the first of the sort that have reached this country, and they afford an excellent example of one of the most important applications of photography, the production of trustworthy evidence of exploration in unknown lands. For these reasons a medal might well have been bestowed upon them. Mr. Gale (who takes the medal for lantern slides) has some exquisite little figure studies. Mr. Donkin shows some more of his well-known Alpine views (as he is one of the judges they are out of competition), and Captain Abney supplements these with some fine Swiss pictures from points below the snow line. Mr. Cobb, whose instantaneous views of London streets are in all the shop windows, has a rival in Mr. England, who exhibits a delightful series of tiny pictures taken from a tricyle with a small camera. Mr. Wyles and Mr. Mallin show pictures of flying gulls, remarkable as illustrations of the powers of modern dry plates. Messrs. Benque and Co. show some admirable portraits printed in platinotype, while remarkable photographs of lightning have been contributed by E. S. Sheppard and J. Guardia. These, like all previous photographs of the same sort, show nothing of the conventional zig-zag flash, but give either waved lines like those produced by the spark between the terminals of a powerful electrical machine, or a series of such lines branching out from the principal lines. Also worth notice are the pictures sent by Seymour Conway, R. G. Wilkinson, L. Sawyer, W. Wainwright, Messrs. West (yachts), G. Davison, T. Hall (some fine heads of dogs, but a little too much "retouched"), the School of Military Engineering, and G. Renwick.

A NEWSPAPER CORRESPONDENT AT A PHOTOGRAPHIC WORKS.

The *Pall Mall Gazette* gives the following account of the works of Boussod Valadon and Co., the successors of Goupil and Co.

Asnières, from its position and from the view it commands, may be called the Hampstead of Paris, and in the spring and early summer months is not unworthy the comparison. It is manifestly a suburb, but a very clean and whitewashed one, and the skill with which in succeeds in concealing the several factories that nestle in its bosom is as praiseworthy as it is satisfactory. The works are off the main street, and the building bears its character on its clean face—a manufactory of the more dainty "industrial arts." On entering the building I was struck with its resemblance, on a small scale, to the Portland Convict Prison, which I once visited—on inspection merely. Great copper-plate presses to the number of twenty occupied the nearer portion of the ground floor, in two rows; beyond where the building was crossed by a huge bridge, that carried the private officers, stood a great circular table; and farther on women were stitching and affixing the wrappers of "Les Lettres et les Arts," "Great Artists," and the other well-known publications of the firm. About a hundred and fifty hands were working in the place, and they were about the quietest band of workers I have ever been among. M. Rousselon, hitherto the presiding genius of the place, the man who, having brought everything in it to perfection from the very inception, has recently handed over the reins to younger hands, met me at the door, and before showing me what I had chiefly come to see he led me first to the great round table.

"Here you will see our process of Photoglyptie," he said, "our improvement on the Woodburytype. A picture is photographed on to a gelatine plate through the medium of bichromate of potash. and the result is as delicate in shades and tones as the originals. But, mark me, these shades consist of a deposit in relief on the transparent film of gelatine, the amount of relief being in exact proportion to the darkness of the shades. Though it looks so frail that merely to breathe upon it would be to destroy it, gelatine and all, it is not only indissoluble, but absolutely incompressible. Then we take a perfectly smooth plate of lead or antimony, an inch thick, framed with iron, and place it in this hydraulic press with the gelatine film upon it. This press, sir, is the most powerful in the world, being capable of a crushing-strain of a thousand tons. By applying a pressure of 700 lb. per square inch by means of a 35-centimetre piston, the design on the gelatine becomes impressed on the lead tablet. From these tablets the so-called photographs are printed in brown ink in the ordinary way, and as each takes a while to dry before the workman removes it from the press, we use this revolving table, with six presses, for him to print on continuously, for as soon as he has finished the sixth the first will be dry and ready for him again."

"I will now show you the process of the growth of photogravures; their birth I cannot; that is our great secret, which no one has ever yet found out."

"How have you succeeded, with so many men about, in keeping that secret so long?"

"Only one man here knows it, and, extraordinary as it may seem, only that one man is employed in what I may call taking the photogravures. Every plate passes through his hands; no other employé here could replace him without special instruction. Now, in there—" he continued, pointing through a doorway; so "in there" I consequently walked. "No, no, come back," cried my guide, in an agonised voice, in which courtesy was drowned by alarm, as I reached the threshold, and where I saw—that which I did see; "that, I was going to say, is the secret department. No one enters there. Having primarily photographed the design on the metal plate through the medium of gelatine and so forth, we bring it to the laboratory. Pray follow me." The laboratory, which we now visited, is a large shed attached to the main building, about thirty yards in length, plentifully supplied with electric apparatus: here the necessary deposit on the plate is produced (which renders it capable of printing impressions like a mezzotint plate) by means of the electric pile—the process of galvanoplastie, that is to say, which was begun in 1869, and published three years later. "See," said M. Rousselon, picking up a strip of metal from the ground, "I put this in the bath, and in three seconds we have a deposit of copper. I place it in this other bath—one, two, three—and now you see all the deposit is removed. You see how great a part electricity plays in our processes. In something the same way we obtain a steel 'face' on the finished copperplate of a picture to harden it, and as soon as it begins to show signs of wear we wash off the remaining steel and reface it, when it is as perfect as ever. We can take two thousand impressions without refacing, but the ordinary so-called photogravure requires to be doctored after every couple of hundred or so.

"It is a mistake to think that manipulation or touching up to any extent is required after the plate leaves the bath. It is practically finished, but for a possible blemish which the engraver rectifies. Of course it often happens that an artist is not satisfied when he first sees his picture in black and white—chiaroscuro may not please him, or he wants it a little darker here, or lighter there; but this is no fault of the process." Evidently, Turner himself would often have the values, even the objects, in his pictures entirely altered in the plate; for he well knew—none better—that when colour is absent the various parts of a picture may bear entirely different relations to each other. It is this power of compensating for colour when rendering a picture in black and white which makes the great engraver.

Leaving the laboratory we passed again into the great hall, where men were straining their thews and sinews in grinding out prints and proofs of photogravures by struggling with the six-spoke wheels or radial arms with which the presses are provided. "We turn out half a million centimetres of photogravures per annum," said my guide, "twenty thousand pounds' worth for English publishers alone, not counting the orders of our London house. Each pressman here can print from ten to thirty-five plates a day, according to the size and subject. The same rule governs them as governs the ordinary printer of engravings—the printing being precisely the same."

On we went through the "drying room," where scores of engravings were hanging up like towels to dry, as the paper is always damped before being printed on; out of the main building, past the prettily laid out little flower gardens, which occupy the space between the works and outhouses and the manager's residence, through the paper stores and composing room into the printing machine room. "We have the most perfect machinery for printing fine work and the most beautiful founts of type ever cast. Our publications prove that. Have you ever seen a broken or even a worn letter in one of them? No? Ah! A damaged type or soiled sheet is always destroyed at once." The presses are evidently tended with as much care as the engine-driver lavishes on his locomotive in the States. The whole printing room, including the curiously clean printer, is, like the editions it produces, *de luxe*.

Then we pass on round some winding paths to the large *al fresco* "photographic studio," erected on a stage, like a miniature terrace at Richmond, and commanding nearly as beautiful a view. Here in the pure light pictures and articles of all kinds are photographed for the various processes with which the firm is identified—photography, photogravure, aquatint, phototypie, typogravure, and the other "crosses" of these processes, whose distinctions are too delicate to be thoroughly appreciated by the uninitiated. This apparatus can take photographs forty-four inches wide.

As we return through the main building my guide is waylaid by artisans who wish to submit to him the photogravures they have been printing in our absence. He criticises them in rapid order and with characteristic terseness. "What colours have you used in that ink? It's altogether too hard," he says to one. "Don't you know better than to bring that yellow thing to me?" he asks another, with quiet scorn. The untutored eye would hardly have detected the superfluity of yellow complained of. Then to a third, "That's good, very good indeed; how long did you leave it in the bath? Ah, well; a little lighter here and darker in the shadows, and it will do." "For heaven's sake, my lad, put a little more feeling into your work," he says to a fourth, planting himself square before him with arms akimbo; "one would think that mangling was more your line than art printing." Then, turning to me, he adds, in a low voice, "Our men are all more or less artists in feeling, but we must wound their *amour propre* a little from time to time—it keeps them going.

Next we pass by the room where those beautiful photogravures in colours are produced—in which the print rivals the original water-colour drawing in exquisite delicacy of tint and shade. The plate is in reality painted upon in colours instead of being inked, and the picture is printed at a single impression. So popular are these prints that the demand in London alone would absorb the total the Asnières works can produce, but the process of colouring the copperplate is very slow, and the supply in consequence is limited.

Having now shown me all that a visitor may see, the courteous M. Rousselon took leave of me to attend to the knot of clients who had congregated during our tour, and now awaited him in his office on the bridge. That office now knows him no more, as he has since retired on the laurels, ribbons, and decorations his services in this department of industrial art have won him, and that have made the firm he served the premier house of the world.

DEVELOPERS FOR INSTANTANEOUS EXPOSURES.

Do Heat and Moisture Affect the Sensitiveness and Keeping Qualities of Plates?

BY F. C. BEACH.*

My experience in the development of instantaneously exposed plates has been somewhat limited, but such knowledge as I have gained from observation and experiment has led me to believe that for objects on land and others of a dark nature, such as buildings, street scenes, &c., in order to secure an image that can be readily and satisfactorily developed, it is advisable to use the lens at its full aperture, having the shutter work at tolerably fast speed.

Exceptions to this mode of procedure are to be noted in climates and countries where the sun is of extraordinary brilliancy, such as South America, India, Japan, &c., where a stop as small $\frac{f}{16}$ and $\frac{f}{32}$ may be used with safety.

In taking pictures of marine objects I have generally used a stop as small as $\frac{f}{16}$, but have known of instances where a stop $\frac{f}{32}$ was required in order to prevent over-exposure. Hence I do not advise the use of too small a stop, but rather recommend a large stop and a quick-acting shutter.

A few weeks ago I received a communication from one of our members bearing on this subject which will doubtless be instructive to some of us. He says:—

"I was recently in West Virginia and Western Maryland, and took with me my little detective camera and a lot of last year's Seed's plates, which had always given me good results. The plates were part of a batch specially made for me in April 1886, No. 869; they were evidently flowed on whole plates 6½ by 8½, and then cut down to 3¼ by 4¼. They worked splendidly during that summer until October or November, when they began to show a drying fog along two edges, and a slight transparent deterioration along the edge touched by the pasteboard matt frames. On developing my exposures, at the conclusion of my trip, I found to my chagrin that the plates had deteriorated in the prolonged hot weather, and do what I would they came out thin and slow with little 'snap.' The whole surface seems to have been affected, and the appearance was so peculiar as to lead me to conclude that it must be due to the excessive humidity of the atmosphere of the late prolonged hot spell. I have observed it in nearly all brands of plates. It was so damp at my summer residence that a box of cigarettes left on the shelf for two weeks became fairly soggy. Some fine fresh Seed and Ripley plates, kept in the same house a few weeks during this humid period, utterly refused to respond to instantaneous shots.

"In my city residence I had similar plates stored in an upper storey where it was hot and dry, but they also had deteriorated. A lot of last year's Carbutt No. 25 were ruined. Strange to say, a box of Cramer's, nearly three years old, withstood the trial admirably, as the enclosed print shows. But I can do nothing with this year's Cramer No. 25, and I fancy he has altered his sensitometer numbers, and that his new No. 40 is about the same as his old No. 25. (A blue print from the negative on the three year old plate was then passed around.)

"Last June I had a singular experience with a lot of plates specially prepared for me. They turned out to be a sad disappointment. The gelatine was so soft that it simply dissolved off in the developer in spite of ice. There was no frilling, it simply soaked off, so that half an inch around the margin became clear glass. When I had finished the development of nearly all of the plates exposed on my trip, I reserved six for development in the following experimental solution.

Ferro-cyanide of potassium (yellow) ...	1½	ounces	(avoir.)
Carbonate of potassium C. P	1½	,,	,,
Carbonate sodium C. P. dry	1	,,	,,
Sulphite sodium crystals C. P.	2	,,	,,
Hot distilled water to make	10	,,	,,

Filter when cold.

"I used the above in place of the Beach potash solution. It was very energetic in its action, half as much as the usual amount of potash solution being sufficient to easily develop the plate, while it was advisable also to employ a few drops of a ten per cent. solution of bromide of potassium to restrain. With this modification I succeeded in obtaining from the six plates fine "snappy" negatives, free from the annoying fog that had spread over all the other deteriorated plates, with clear shadows, and the high lights of that soft creamy grey that so delights the eye, and prints so well in the wet plate process. If potash and soda are alone used, the film seems to possess a cold hard grey colour, but the addition of ferro-cyanide appears to give it a warmer creamier grey.

"The formula, it seems to me, should be further experimented with. The addition of some sort of bromide appears to be necessary, and I have thought bromide of cadmium might assist in preserving clearness in the shadows, and at the same time effect a better colour, more like that of a wet plate, in the film.

"A developer for a fully timed instantaneous shot in a good light is made up as follows:—

Beach's pyro solution	1 dram
Ferro-cyanide solution...	20 drops
Bromide potassium solution	2 ,,
Water	8 ounces

---

* Read before the Society of Amateur Photographers of New York.

For an insufficiently timed instantaneous shot, in dim light, or with a comparatively thin plate, use :—

Beach's pyro solution...	1 dram
Ferro-cyanide solution	30 to 40 drops
Bromide of potassium solution	5 to 6 ,,
Water ...	3 ounces

For a time-exposure on a slower grade of plate I advise increasing the amount of pyro solution by half a dram, and using less of the ferro-cyanide.

" If my suggestion should help you to solve the problem of how to get 'snap' and good detail from a very short instantaneous exposure in defective light, or from plates which show an annoying tendency to fog before sufficient printing density can be obtained, I shall be delighted."

Acting on the above suggestions, I undertook, by some recent experiments, to test the working of different alkalies when added to the developer, with a view of finding out which, if any, gave the best results on very short time plates. I first cut an eight by ten Cramer (30) plate into four quarters in order to be sure of having the same emulsion and the same degree of sensitiveness. I then gave each of the four by five plates a uniform exposure (about one-third of a second), using a Hoover shutter in a Ross rap. sym lens $\frac{f}{4}$ on one subject, all within ten minutes, and had a uniform light.

In addition to the regular pyro and potash solutions, I prepared three solutions as follows :—

No. 1.—Carbonate of soda (granular)	30 grains
Water	1 ounce
No. 2.—Ferro-cyanide of potassium	60 grains
Water	1 ounce
No. 3.—Bromide of cadmium	10 grains
Water	1 ounce

Having on hand the pyro and potash solutions prepared after my formula (the potash solution containing in each ounce 172 grains of potash, and 109 grains of sulphite of soda) I proceeded to mix fresh developers for each experiment about as follows :—

Experiment 1.

Beach pyro solution—(Equivalent to 6 grains)	1 dram
,, potash ,, (,, ,, 21 ,,)	1 dram
Water ...	1 ounce and 6 drams

Temperature of solution 67° F. Poured over plate without previously wetting same. Image appeared in 10 seconds, development completed in 2 minutes, temperature of developer at 70° F. Solution very clear, of light orange colour.

Experiment 2.

Same pyro solution	1 dram
,, potash ,, (Equivalent to 11 grains)	½ dram
Carbonate soda solution (Equivalent to 2 grains	⅓ dram
Water ...	1 ounce and 6 drams

Temperature of solution 66° F. Image appeared in 10 seconds. Development completed in 3 minutes, temperature 70° F. Solution very clear.

Experiment 3.

Pyro solution ...	1 dram
Beach pyro solution (Equivalent to 7 grains)	20 minims
Carbonate of soda solution (Equivalent to 1½ grains)...	20 ,,
Ferro - cyanide of potassium solution (Equivalent to 3 grains)	20 ,,
Water	1 ounce and 8 drams

Temperature 67° F. Image appeared in 15 seconds. Development completed in 3 minutes, temperature 70° F. Film appeared to keep quite clear. Solution was also very clear.

Before trying experiment No. 4, which was intended to be precisely the same as No. 3, with the exception of the addition of bromide of cadmium, I found by a few test trials, the latter chemical formed a precipitate in the presence of carbonate of soda or ferro-cyanide of potassium alone, but did not do so in the presence of either pyro or carbonate of potash, hence I was restricted to the following :—

Experiment 4.

Pyro solution	1 dram
Beach potash solution (Equivalent to 21 grains)	1 dram
Bromide of cadmium solution (Equivalent to 1 grain)	48 minims
Water ..	1 ounce and 5 drams

Temperature 66° F. Image appeared in 20 seconds. Development completed in 4 minutes. Temperature 70° F. Developer of a straw colour on the start turned quite red, but kept clear. Picture on surface of film kept quite clear during the different stages of development, showing a crispness that did not appear in experiments 1, 2, and 3.

In each experiment it will be noticed that the temperature of the developer increased three degrees, indicating that the chemical action evolved heat, though it may have been absorbed from the surrounding atmosphere, which was 76° F.

In all cases the developer was applied directly to the dry film of the plate, and every precaution was taken to have each experiment made on as uniform a basis as possible. Examining the resulting negatives before a blue sky by transmitted light, one is struck by their similarity in colour. Taking No. 1, which corresponds with experiment 1, we observe that it has what may be called a greenish grey colour. No. 2, developed with pyro and potash, and soda, has about the same density as No. 1, but a lighter grey, and more of a bluish colour.

No. 3, combining ferro-cyanide with the potash and soda, is more dense, and has a clearer grey colour than No. 1.

No. 4 has a darker grey colour than No. 1, but is lighter in the shadows, and much more dense. No. 4 took the longest time to print from, but if you will examine the silver print, and compare it with prints from the other negatives, you notice that it is much more brilliant.

Very likely the additional density in this negative may be due to the extra minute consumed in developing; but, judging from the brilliancy and contrast with which the image came up, I conclude that the bromide of cadmium must have had some good effect, and hence I advise its use, and a corresponding decrease in the amount of pyro; otherwise, with slower development, too great density will be obtained.

In comparing the amount of alkali contained in the various developers with that in the developer suggested by my friend, I find that I have an average of 16 grains to the two ounces of developer, while he has an average of 9 grains to three ounces, or more than one-half less the strength of mine. The strength of his alkali solution is 65 grains to the ounce.

Eight grains to the ounce of developer, then, of any of the fixed alkalies may be considered a good maximum strength for the development of an instantaneously exposed plate; if more alkali is added, the tendency is to veil the film so much as to prevent the production of a good printing negative.

If these experiments prove anything, they show that if sufficient sulphite of soda is used in the developer, the colour of the film varies very little, regardless of the kind of alkali used; while a liberal amount of alkali, tempered with a light bromide, such as cadmium, and added judiciously, produces the best developer for instantaneous exposures.

The question as to whether heat and moisture—or, commonly speaking, excessive humidity—injuriously affect plates for quick work, is one that I have not sufficient experience on, to hazard an opinion. The experience related seems to show that some deleterious effect was produced. If we could collect evidence from several different sources during the same period we might determine accurately the injurious consequences of humidity. I suggest it as a good field for further experiment. In all of the negatives exhibited you will observe they are uniformly equal in amount of detail, showing that there is no choice to select from as to alkalies. My preference is for the soda and potash, or the potash and bromide of cadmium.

Patent Intelligence.

Application for Letters Patent.

13,332. Jules Decoudun, 53, Chancery Lane, London, for "An improved photometer for measuring intensity of light in the photographic camera."—1st October, 1887.

Official Abstract of Accepted Complete Specification.

Foxlee, 15,727, 1886. "Sensitized plates, films, &c." Stripping film with gelatine support coated on both sides with collodion.

Specifications Published.

5772. Lewis Wolff, Black-lead Pencil Manufacturer, 30, York Road, Battersea, S.W., for "Improved photographic mounting cards."—Dated 20th April, 1887.

The patentee claims the use of adhesive mounts.

13,240. **John Edward Thornton**, 3, New Lorne Street, Moss Side, Manchester, in the county of Lancaster, Printer, for "Improvements in cameras."—Dated 18th October, 1887.

The claims are :

1st. In a photographic camera, the form of construction and method of attaching a turntable to the base-board, as also the employment of a cam for fixing the base-board in any position on turntable, substantially in the manner described.

2nd. The method of attaching camera legs to base-board by the employment of elongated holes or slots, or of spring jaws attached to underside of turntable as described.

3rd. The method of connecting or disconnecting the fork attached to front board of a photographic camera with the upper pinion, or pinion which gives motion to the front board, or to the shaft thereof, as described.

4th. In combination with a revolving lens panel in the front board of a photographic camera, the employment of a flange or ring for covering edge of said panel, the division of front board. so that part may slide or be drawn out for removal of lens panel, and spring for fixing position of lens panel, in the manner and for the purpose described.

5th. In combination with lenses attached to a revolving panel, the employment of a cover or plate for exclusion of light in such lenses as are not in use.

6th. The employment of angular metal guide rails for guiding extension frame in a photographic camera, and in combination therewith the general construction and arrangement of sliding-frame and base-board, for the purpose and in the manner substantially as described.

7th. The use or employment of a pointer or indicator attached either to the body of a photographic camera, or any other part thereof, for the purpose and in the manner substantially as described.

13,620. **Alfred Walter Dollond**, of 66, Hurlingham Road, Fulham, in the county of Middlesex, Clerk, for "Improvements in tripod camera stands."—Dated 25th October, 1886. (Particulars next week.)

14,099. **Alexander Kellar**, of Dumfries Engine Works, Bute Docks, Cardiff, in the County of Glamorgan, Engineer, for "Improvements in apparatus for washing photographic prints."—Dated November 2nd, 1886.

This invention relates to the construction of an apparatus for washing photographic prints, consisting of a perforated cylinder capable of rotation within an outer vessel.

14,120. **Edward William Parkes**, Salters Hall Court, in the City of London, Gentleman, for "Improvements in the production of coloured photographic pictures."—Dated November 2nd, 1886.
(Particulars next week.)

14,262. **Henry Park**, 1, Orchard Buildings, Kingsland Road, in the County of Middlesex, Photographic Apparatus Manufacturer, for "Improvements in the construction of photographic cameras."—Dated 5th November, 1886.
(Particulars next week.)

14,401. **Alexander Browne**, of 9 and 10, Southampton Buildings, Holborn, in the county of Middlesex, Patent Agent, for "Improvements in the production of coloured photographs." (Communicated from abroad by Louis Jacques Henri Cellerier, of Asnieres, France, Photographic Chemist.—Dated 8th November, 1886.

The patentee says :—

I in the first place take a negative in the ordinary way, and from the same I produce an ordinary carbon print by what is known as the double carbon process.

I then take an ordinary silver print from the negative, and place it, with a sheet of paper of fine evenly expanding texture coated with arrowroot or similar starchy substance, in a bath of cold water, and when properly saturated I bring the two into contact evenly, the paper being uppermost ; and when this is done they are placed in this position on an ordinary retouching desk, when the outline of the silver print will be seen through the aforesaid paper, giving a guide to indicate where the colours required should be laid on. The colours are ordinary moist colours, and are laid on where necessary evenly in flat washes, detail not being necessary. During the painting the paper and silver print should be kept damp to ensure contact. When the painting is finished I proceed to the next process, which has for its object the superposition of the carbon print on or over the coloured paper. To carry out this process I proceed as follows:

I float the paper having the colour upon it on the surface of cold water in a suitable vessel with the colour uppermost, and when it is sufficiently saturated and expanded to fit the print on the glass above described, the two are brought together and firmly pressed. Great care is necessary in this operation to properly register the paper having the colour upon it with the film on the glass, which film has had an extra coat of gelatine put upon it in order that the paper may adhere to the film. The paper is then subjected to the action of steam until the paper and the pellicle upon the glass firmly adhere to each other. When the paper is dry it can be stripped off the glass with the pellicle adhering to it. It is then placed in a moderately strong solution of alum, washed, finished, and mounted in the ordinary way. The result is a highly-finished coloured photograph, leaving the original photograph perfect in all its tones, lines, and shades.

Having now particularly described and ascertained the nature of this said invention, and in what manner the same is to be performed, I declare that what I claim is :—Producing coloured photographic pictures in the manner and by the process described.

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Correspondence.

A SUGGESTED NON-ACTINIC MEDIUM.

Sir,—May I suggest what I believe is a novel and the best non-actinic glass for the dark room ? Take a sensitive plate of the size of your intended window or lamp-glass, expose it to a white light, giving such exposures, either in a camera or not, as will give good density. Develop, fix, and intensify with Schlippe's salt, dry, and expose over sensitive paper, which should remain perfectly white, for there is perhaps nothing at once so translucent and so opaque to actinic rays as the lights on a plate intensified with this salt. The paper will prove an excellent test of the scarlet negative, and show any pinholes or other flaws, which may be stopped out before the plate is varnished and fixed into its place.—Your obedient servant, H. Wilson.

A PHASE OF COMMERCIALISM.

Dear Sir,—The explanation of Mr. Henry Sturmey in your issue of September 30 may be good as far as it goes, and it brings the question which I raised to a simple issue.

I have not complained against him, however, but against the London Stereoscopic Company for *appropriating my invention without my previous knowledge or consent.* If that firm made to him the assertion that "*the inventor of the shutter was willing it should appear in their name,*" I must (using the mildest language that the case will admit) *give that assertion my absolute and unqualified denial.*

Mr. H. Sturmey was no doubt satisfied with what the L. St. Co. told him, and thus thought it useless to come and see me, as I had been led to expect, and get the information from the maker himself, instead of from the dealer.

Apologizing for troubling you with this matter, I am dear sir, yours truly, J. R. Gotz.

PHOTOGRAPHS OF OLD LONDON.

Dear Sir,—In your Notes last week you refer to Mr. Marks, Secretary of the Society for Photographing Relics of Old London, having issued a statement that the printing was stopped, and only a very few sets left. It is so. The sets left are *very* few ; the photos issued have *all* been printed in carbon ; the negatives are still in existence.—Yours truly,
Henry Dixon.

◆

Proceedings of Societies.

London and Provincial Photographic Association.

An ordinary meeting took place on the 29th ult., **Alexander Mackie** in the chair.

H. M. Smith passed round for inspection a few negatives made by means of the "Ready Photographer"—a pinhole puncture in tinsel at one end of a cardboard box. The images were somewhat blurred, and some form of rigid support to avoid vibration was suggested.

A. L. Henderson, when cleaning a much tarnished Daguerreotype, noticed some portion of the amalgam containing the image split off the copper base in flakes, the copper surface appearing spongey. Various suggestions were offered; among them, that an old plate had been used, and imperfectly polished; the plating was upon a dirty surface; and that chloroform varnish, sometimes employed, might split up and bring a layer of metal with it.

W. Lang, Junr., related some particulars concerning the Industrial and Fine Art Exhibition to be held in Glasgow from May to October, 1888. Photographs, he said, were to be classed with fine arts, and, having charge of the section allotted to photography, he would do all in his power to make it a success.

M. Stebbing said the French Photographic Society intended getting together a good display of photographs at the International Exposition of 1889. Some prizes were offered. M. Davanue would give £40 for a process which embodied all the good qualities of wet collodion and modern dry plates. It was also proposed to organise a sort of conference of photographers, to be held in Paris during that year.

J. Traill Taylor touchingly alluded to the decease of the veteran photographer James G. Tunny, which took place on September 24th in Edinboro'. He then read an obituary notice which was to appear in his journal. A vote of condolence with the family was then passed.

The Hon. Sec. drew attention to some plates coated with collodion emulsion more than a year old. These were badly reticulated, and in a short discussion which followed it was pointed out that too much water had probably been allowed to remain in the cotton after washing.

J. Jackson was elected a member of the Society.

Talk in the Studio.

Politics and Pictures.—With reference to this matter, referred to by us last week, the *Globe* says:—"Mr. Schnadhorst has been advertised by one of his London organs as being before the times in a new political departure. The novelty consisted in the production and exhibition of political lantern slides, of a decided Gladstonite bias, to be utilised at those meetings which Mr. Schnadhorst knows so well how to organise. This method of persuading public opinion is effective, and the extent of its popularity may be estimated by the number of starers who are attracted every night on the Paris boulevards by a simple exhibition of transparent advertisements somewhere in the neighbourhood of the Passage des Panoramas. The same experiment has also been tried by way of advertisement for the Princess's Theatre; and the blocking of the pavement which ensued showed that the people are still, as ever, partial to pictures as a means of information and education. They begin life with an illustrated alphabet; and they are quite content to continue in that pleasant path. But, as a matter of fact, honour to whom honour is due: Mr. Schuadhorst is not the first to illustrate politics by photography and the magic lantern slide. More than a year ago an enterprising Conservative conceived the idea of strengthening Conservative convictions by an exhibition of political cartoons. The slides were exhibited with marked success at various meetings last winter; and, bearing this in mind, we see at once that Mr. Schnadhorst is handling a two-edged weapon, which may possibly cut his fingers. For two can play at the political photograph game."

Photographers' Benevolent Association.—It has been announced that the entrance fees received at the forthcoming Amateur Photographic Exhibition organised by the London Stereoscopic Company will be given to the Photographic Benevolent Association, and we are informed that the time for sending in exhibits has been extended to the 20th of the present month. In a letter to the Photographic News the secretary of the Stereoscopic Company says, "Our reason for giving this extension of time is owing to the numerous letters that have reached us from amateur photographers, stating that owing to absence from home, they have been unable to develop and print their specimens." But in a letter to the secretary of the Photographers Benevolent Association another reason is given, viz;—"We have extended the date to the 20th inst. chiefly in the interests of your Association." We are glad for so useful and deserving an association as the "Benevolent" to advantage from the entrance fees, but think that in the present case the commercialists have got the best of the bargain by virtue of the extensive use they have made of the names of those identified with the "Benevolent."

Photographic Club.—The subject for discussion on Oct. 12th will be "Photography by Artificial Light." Saturday outing at Hampstead; meet at "Bull" at 6 o'clock.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

J. C. J.—The corrections have been noted.

C. M.—You should have sent the telegram to the address we gave you.

Oxon.—It is a great compliment to you to be asked to furnish it for the illustration of the journal in question, but you should distinctly stipulate that proper mention is made of the fact that the engraving is from one of your photographs.

Iron Printing.—No method is known by which a shorter exposure can be made to serve.

Box.—Substitute the sign † for the star in the case of the foot-note, and you will then understand all.

Moo Cow.—1. It is quite time to drop the affair. After all, it was a comparatively trivial fault, and one that may well be excused under the circumstances. 2. Not unless you allow us to append your name to the remarks; still, we largely agree with your view.

A. H. Newstead.—The markings are due to imperfect fixation, and this may be the consequence of using a hypo bath which is abnormally cold—that is to say, immediately after the salt has been dissolved—or from an insufficient time in the bath.

Expectation.—See answer to "A. H. Newstead."

Camerist.—See article on Matthew Whiting's amateur studio at Wandsworth. It appeared in the News issued on January 30, 1885.

M. D.—In the centre of the field of such a lens, fine lines one two-hundredth of an inch apart on the plate should be shown as distinctly separate, but we have known instruments which would do much better than this. Rule your lines one-twentieth of an inch apart, and reduce in the camera to one-tenth scale. 2. From the photograph we should say the lens is not quite first-class, or that there was some vibration during exposure. Great care is required to prevent vibration when testing a lens.

R. R. Taylor.—See answer to "Camerist."

M. Billing & Co.—Order the book from a foreign bookseller, as Trubner, of Ludgate Hill, or Nutt, of the Strand. You will probably get it in a week or ten days.

J. B.—1. With a lens working at $\frac{f}{40}$ about sixteen times the exposure would be required. 2. We should prefer to use one of the extra rapid rectilinear type. 3. About twenty-five feet long and thirteen feet wide. 4. Under the circumstances we recommend the former.

Vincent.—Both can be obtained through Marion, of Soho Square, or Negretti and Zambra, of Holborn Viaduct.

Lex.—Thirty cells will give a small and not very satisfactory arc with the arrangement in question, but sixty will give light enough for projecting pictures on a large scale. You *must* not go below thirty, and *need* not go beyond sixty. Forty-five may be a convenient number to fix on.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

VOL. XXXI. No. 1519.—October 14, 1887.

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THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

SECOND NOTICE.

TURNING to the left as one enters the Gallery, the first pictures to meet the eye are good samples of that which the British photographic tourist delights to do—viz., to represent the rich combination of water, land, and foliage afforded in so many frequented nooks in this country. No. 1 ("Bridge on the River Teign, Chagford, North Devon," by A. T. Newington), and No. 2 ("On the Lledr River, North Wales," by R. B. Berry and Co.), being typical examples of English scenery well represented by the camera. Mr. Newington also contributes No. 396, Castleacre Priory Church, and No. 424, some cottages in Cambridgeshire; these being enlargements. The yacht photographs of W. H. Hyslop having already been mentioned in our last, No. 3, "The Yacht *Thistle*," taken direct on a large plate, requires no further criticism; indeed, Mr. Hyslop is admitted to stand foremost at present as regards this particular branch of photography.

In No. 4 ("Interior of Osmaston Manor, Derbyshire") we have from Richard Keene the sort of work he delights to do—and, delighting in his work, he does it well.

Nos. 26 (Views in Scotland, taken during the Convention of 1887) and 47 ("Interiors of Hardwick Hall") are other examples of Mr. Keene's work. No. 5 is the only frame contributed by Septimus Penny, and it contains three small views—Swadleys Hall, Hillingdon Church, and Maple Durham House. Jonas Watson not only sends No. 6, a singularly pleasing view of Landaff Cathedral showing over some trees, but also No. 181, an enlargement showing the "Twenty-Arch Bridge at Killarney." No. 7, "Ball Room, Jesmond House," looks as if the only aim of the photographer had been to include as much of his subject as possible, and, moreover, to get that as symmetrically as possible on the sheet; it rather reminds one of the style of photograph which is ordinarily done for the house agent or auctioneer.

"Portrait of Baby" (No. 8) is certainly above the average standard of the show-case, as there is much character in the slightly-pouting and evidently much-petted girl-child; while No. 9, "China Vases with Begonias," by Henry Stevens, shows Mr. Stevens to be a careful manipulator; but in his "Home Groups" (No. 28) the models hardly look at home and at ease. His remaining exhibits are also in kind repetitions of his work at previous exhibitions. E. Bell's "Wild West" (No. 10) has a stagey look, and does not attract us very much; while No. 11 ("Humble Fare," by Luke Berry), No. 12 ("Medmenham Abbey," by Alfred Ellis), No. 13 ("The Captive Queen," by W. R. Cassels), and No. 14 ("Girl with a Mandoline"), all merit careful study.

Clive F. Pritchard only sends one exhibit (No. 15), "Three Giants," the "Eiger, Monch, and Jungfrau;" these being mounted together, panorama fashion, with excellent effect. The originals were on the Eastman stripping film. In Nos. 16 and 197 we have excellent examples of the pleasing views that Matthew Whiting knows so well how to make. He still adheres to the field club size, and this time his views are partly Scotch, and partly English. No. 17 (Cartland's "Olympia") was referred to last week, and No. 18 is an enlargement by F. Müller, of Munich, this exhibitor also sending a large selection of very attractive show case work (Nos. 277, 290, 293, 436, 573). Of these No. 290, to which a medal has been awarded, was referred to last week.

The "Cottage at Dunster, Somerset," of Edmond Hyde (No. 19), is one frame of a large number of capable rural studies by the same photographer, his other exhibits being Nos. 437, 477, 478, and 479.

We have so often seen photographs and paintings of St. Paul's Cathedral, taken from a high point of view along the line of Fleet Street, that No. 20, by J. Bracebridge Hilditch, comes without freshness. Moreover, the Cathedral shows so clearly through the distance as to make the picture the least bit unreal to one who is accustomed to the normal haze of London. No. 179 ("Richmond Bridge") by the same photographer, is capital, also his "Teddington Lock" (562).

G. Watmough Webster contributes No. 21 ("Interiors of Eaton Hall") executed in platinotype, and no less than eight other exhibits of varying merit. In No. 95 ("A Reverie") we see a long-haired girl sitting to be photographed, and she looks as if she were thoroughly tired of the occupation.

No. 22 is a domestic subject "My Mammy," by W. W. Winter, and No. 23 is a frame of the views of Penhurst Castle, by S. H. R. Salmon. The reddish tone will please some. W. Wainwright, junr., sends but one frame, No. 25, and this contains good examples of the rural subjects in which he delights.

Nos. 29, 30, and 31 are fine pieces of work by Harry Tolley: 30 being the medal picture, "On the Lonely Shore," noticed last week; while No. 29, "Gathering Lilies," must have—one would suppose—have run it very closely in the competition for the medal. "Three Acres and a Kentish Cow," by H. G. Moberley (No. 32), is pleasing, while 33, 34, 35, 98, 298, are photographs without titles, merely shown as specimens of enlarging on a commercial bromide paper. If, indeed, it were necessary, or even advisable, to exhibit an example of enlarging on the bromide paper in question, it seems strange that the hanging committee should not have been content with one example. The firm exhibiting the above series has been similarly favoured in years past.

T. Blair Scott is a liberal contributor to the Exhibition, show-case portraits being prominent among his exhibits. No. 36 ("Lord Muncaster") is not pleasing, the attitude of the full-length figure being awkward and cross-legged. No. 37 ("Mr. Evans") is less unpleasing. In No. 39, F. W. Edwards gives us a platinotype of a Tinworth panel; and No. 40, also a platinotyye, of H. P. Robinson, was noticed last week.

Lydell Sawyer sends a series of studies, among which may be mentioned, 41 ("Home Sweet Home"), 42 ("The Finishing Touch"), 43 ("The Boat Builder"), 44 ("A Study of Two Sailors"). These have great merit, and fewer faults than one generally finds in subjects of this character. They merit close observation, and we shall say more about them on a future occasion.

The medal awards announced last week have been confirmed, and in the apparatus department the plate-box of Arundel and Marshall has been awarded a medal; also the stripping films of the Eastman Co. The judges in the apparatus department are G. L. Addenbrooke, T. Bolas, J. Cadett, and H. T. Wood.

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PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

The *World* is perhaps more vigorous in its criticism than the papers we quoted last week, and its remarks are as follows:—

The Photographic Society convivially opened their exhibition, at the Old Water-Colour Society's rooms in Pall Mall, with a *soirée*. Now it is hardly polite to object to the photographs of your host at a *soirée*; but some of the proceedings of the Society this year really cannot be suffered silently. The two cardinal defects of shop-window photography are vulgarity and imposture. Vulgarity is a primal curse: it is useless to protest against it; but imposture can be checkmated within the walls of an exhibition by determined and expert judges. What is to be said, then, to the deliberate award of a medal to the no less deliberate concoction of a landscape with several different planes of perspective in it, with the shadows falling in various directions, and with a couple of studio-lighted women twelve feet high, or thereabouts, in the foreground? It is just the picture to catch the public, and just the trick for the Photographic Society to catch and defeat, if they had their duty at heart. As to the fashionable cooking and stippling of sitters' faces until the texture of the skin is like nothing but that of white kid gloves, the Society seems to regard it as a triumph of the art. Mr. F. E. Evans's "Photo-micrographs" are pretty; but they should not have taken the medal on that ground from Mr. Andrew Pringle's more difficult and more valuable photographs of micro-organisms. There is not a single composite photograph in the exhibition. A medal has been given to Mr John F. Robert's gaslight photographs of scenes from "David Garrick," which were exhibited for months outside the Criterion Theatre, and are, therefore, within the recollection of all London as distinct—or rather indistinct—failures. At this rate of judging, a new Photographic Society will be needed unless the present one promptly mends its ways. There are some honest and beautiful photographs exhibited by Captain Abney and other first-rate workers; Mr. Payne's criminals are gruesomely interesting; and the othochromatic photographs are remarkably successful, though they are not really orthochromatic. But none of these are in sufficient force to redeem the overcrowding of the walls with mere tradesman's work that makes gratitude for the *soirée* impossible.

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OPTICAL WORK AT THE ALVAN CLARK FACTORY.

It very frequently happens that the successful optician, like the photographer, has drifted into his occupation from the most freely exercised choice rather by virtue of systematic training or apprenticeship; and the case of the great American optician, the late Alvan Clark, is an illustration of this. He not only began life as a portrait painter, but exercised this profession until one of his sons began to interest himself in the construction of telescopes. He and his son experimented together, and constructed a reflector which so much pleased the authorities of the Cambridge University (U.S.A.) that the optical prism of Alvan Clark was founded.

In a recent issue of the *Scientific American* we find a highly interesting account of the factory and its work, and we reproduce the greater part of the article, and some of the illustrations.

The *Scientific American* says:—

The home and workshop of the sons of the world-famous Alvan Clark is situated in Cambridgeport, just in the environs of Boston, Mass. Leaving the city by the Cambridge road, crossing the waters of the Charles River and turning to the left before the University of Harvard appears, the place is soon reached. It is easily recognized by a telescope tube raised on a high pier that towers above the surrounding objects. A piece of ground of about an acre in extent contains the buildings. In front are three dwelling houses, the homes of George B. Clark, of his brother Alvan G., and of the widow of Alvan Clark, the father. The grounds are very prettily kept as a luxuriant lawn with flower beds and paths. In the rear of the residences is a lofty and now disused observatory, the great rusty telescope tube already alluded to, and a low brick building. The latter, as unpretentious as a structure well can be, is the factory. In it the great Pultowa, Washington, and Lick objectives were made. The least imaginative visitor cannot but feel a sense of inspiration as he treads the truly classic spot that has furnished astronomy with its most efficient weapons. The story of the foundation of the business has already been briefly told. George B. Clark, when a student, made a reflecting telescope. It was so successful that it was the first inducement that caused him to take up the occupation of telescope making permanently. His brother Alvan G., when sixteen years old, entered a machine shop in order to learn the machinist's trade, intending, ultimately, to join his brother. When twenty-one years old he entered his brother's factory. Up to this period the father had only worked upon lenses in the evenings, painting portraits and miniatures by day. But a few years later he gave up his studio and devoted himself entirely to his favourite occupation. Thirty years ago the factory was removed to its present location. The father is dead. His two sons, including the founder of the establishment, now conduct the work personally. When they abandon it, it is hard to say where a successor can be found.

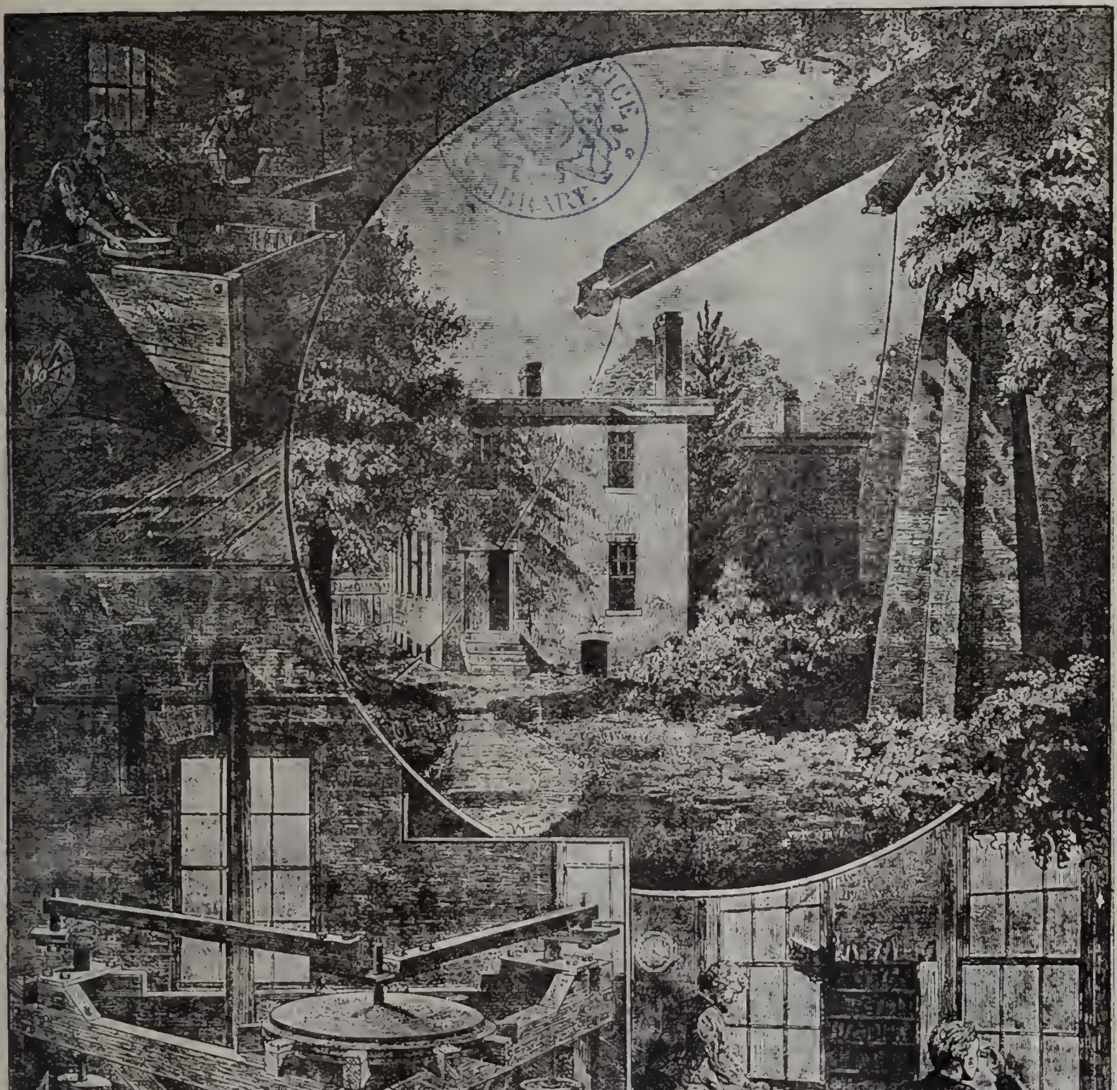
The demand for large lenses is so slight in this country, that the glass disks for their manufacture are generally procured abroad. This is always the case with the large sizes. They may be made in different ways, but one typical method of preparation may be described. A lump of glass of any shape is selected in the glass house, and its specific gravity is determined. If this factor is high enough and the piece appears clear and good, it is melted down into a disk. The lump is placed on a slab of fire clay within a ring and exposed to heat, when it slowly flattens down into the desired shape. This furnishes the blank. If it proves clear and free from striæ, it is ground into shape and polished.

Sometimes the glass plate is delivered in the shape of rectangles. A sheet iron tube, fed with abrading material, is used as an annular saw to cut out suitable disks from such pieces for lenses. The plate is first polished and tested optically with the utmost care for striæ. Small bubbles do little harm, and are contained in some of the best objectives. Such portions of the piece as stand the test are used. Often a lens is cut from the centre, while the corners have to be rejected.

The manufacture of the objective properly begins with the circular disk. This possesses approximately parallel sides, which have been more or less completely polished for the purpose of testing. The processes it is subjected to may be divided into cutting and polishing. The former brings it very nearly into shape, with a rough surface. The latter polishes and imparts the last minute corrections.

The cutting is executed by cast iron laps. These rotate in a horizontal plane. They are cast of the general curvature of the lens, but reversed. They are fed with water and with a cast iron sand. The latter is made by flowing air into melted iron. This blast drives out a cloud of minute vesicles of metal, that are chilled instantly by the air. This material is very fine and is rust coloured. On treatment with hydrochloric acid, hydrogen is evolved, thus proving the presence of the metal. It is used principally by granite polishers, and has been adopted by the Clarks for their work.

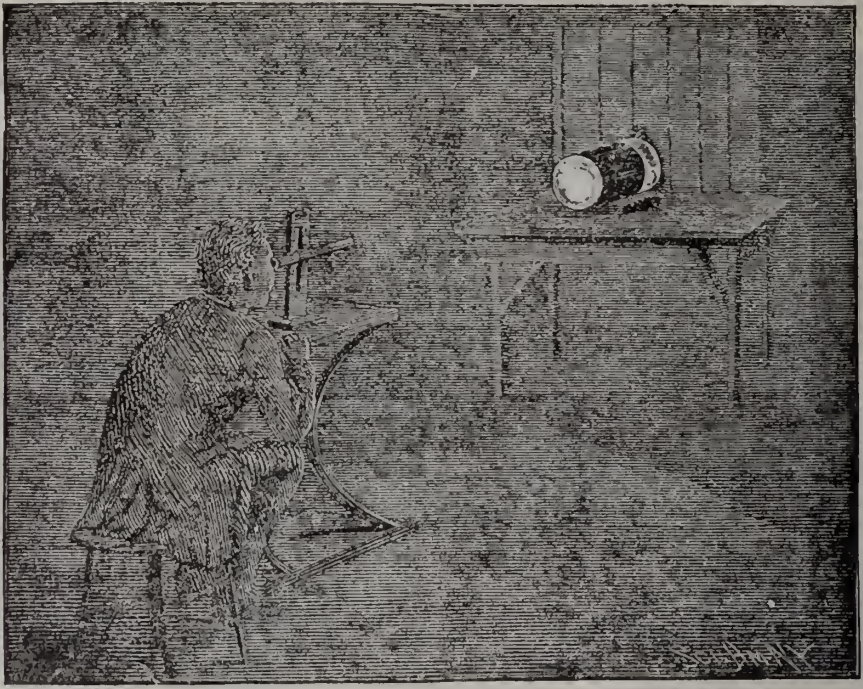
The lens is pressed upon the rapidly rotating lap, being held to one side of the centre, and slowly moved about to ensure regular grinding. Were it held motionless, the part over the centre of the lap would not be cut, and a prominence would soon be created there. The iron sand is the only cutting agent. It possesses a great advantage over emery, in not "breaking down." The grains, owing to their metallic nature, are very tough, and possess great cutting power. In this way the faces of the lens are brought to the proper curvature, and the lens is finally shaped in the rough. It has next to be polished.



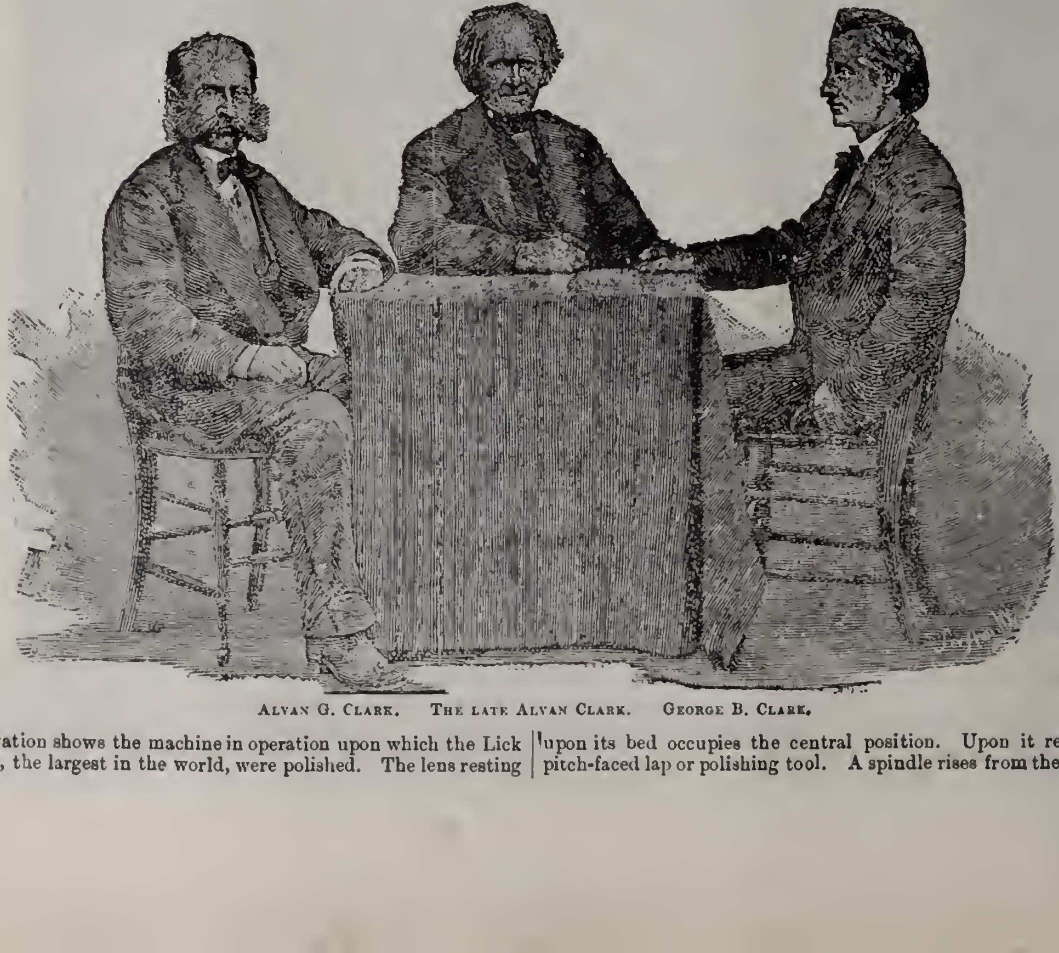
LIBRARY

Grinding Objectives. Machine used in Polishing the Lick Objective. Alvan Clark's Sons' Establishment. Polishing Objectives.

For this purpose a pitch lap used as below or above the glass is employed. For the smaller class of lenses the pitch lap is rotated precisely as is the metal lap, and is fed with water and rouge. Upon it the lens is pressed and moved about by hand. The pitch contains holes or grooves to prevent suction and sticking. The pitch is slightly or rather slowly yielding. It soon assumes the shape and contour of the lens, and polishes it without altering materially its shape. This operation is reversed for the larger lenses. These are rotated in a horizontal plane while the lap, composed of a metal backing and front of pitch, is moved about over the face. The bed upon which the lens rests consists of its original metal lap. Upon this a piece of Brussels carpet is cemented, and the lens is placed thereon. The illustration shows the machine in operation upon which the Lick lenses, the largest in the world, were polished. The lens resting upon its bed occupies the central position. Upon it rests the pitch-faced lap or polishing tool. A spindle rises from the centre



Testing Photographic Objectives.



Alvan G. Clark. The late Alvan Clark. George B. Clark.

of the latter, and on it are journaled two pitmen, working at right angles to each other, and driven by cranks. These impart a double reciprocating motion to the tool. The amplitude, actual and relative, of the two motions can be varied by adjusting the length of the crank arms. One crank is driven at very slow speed by worm gearing. The other crank rotates much faster, as it is driven by tooth gearing. The effect of this is, that the tool follows an endless variety of paths, never repeating its course over the face of the lens The driving gear is seen under the bench, and the face of the pitch-faced lap divided by grooves into squares is also shown. Rouge and water is the polishing agent.

The lens thus shaped and polished has next to be tested. Two methods are used for this work. In one a prism is mounted in a tube attached to a lamp chimney of metal. A flame is maintained within the chimney. This prism is so screened as to furnish a minute source of light reflected outward. The lens to be tested is held in a generally vertical plane. Directly back of it a plane mirror, silvered on its anterior face, is placed. The lamp and prism are so placed that the beams of rays from the prism falls upon the face of the lens, passing through it, and returning again after reflection from the mirror, the prism occupying about the focal position. The eye of the observer is held as near the back of the prism as possible. The lens then appears brightly illuminated, because the eye so nearly coincides in position with the focus. The work is done in a dark room. If the lens is perfect, the field is of uniform brightness, presenting, however, the prismatic colours of the spectrum in broad areas. If the smallest irregularity exists, it appears as a spot or ring or other area upon the glass. To illustrate the sensitiveness of the test, Mr. Alvan G. Clark held his finger for a few seconds upon the face of a nearly perfect lens that was subjected to the writer's inspection by this test. On removing the finger, a strongly defined spot was seen, due to the heat thus imparted to the glass, and several minutes elapsed before it passed away. This was a proof of the extraordinary sensitiveness and perfection of the test. As a further illustration of the effects of atmospheric perturbation, a half dollar which had been held in the hand was laid in front of the lens. With the eye in position a perfect stream of heated air striæ appeared crossing the disk, and resembling in the spectral illumination a cloud of flame. The hand held in front of the glass seemed a source of conflagration, as the same effect on a larger scale was produced. All these changes appeared pictured upon or in front of the face of the lens.

In this method the rays of light pass twice through the lens, so that a doubling of the effect due to a mis-shape is obtained. In the usual methods a star is used as the source of light, so that a single transmission only is had. The Clark process, therefore, is of twice the delicacy of the older methods.

A defect in the mirror might be interpreted as a defect in the lens, but this is very easily provided against by rotating the mirror. If the supposed defect moves with the rotation, it is due to the mirror; otherwise, to the lens.

These are visual tests. For photographic telescope lenses they are not applicable. In these the focussing must have reference to the actinic portions of the spectrum, and such objectives can only be tested photographically. Two methods of doing this are in use by the Clark brothers.

In one the spectrum of a bright spot is photographed. A bulb of glass is set up in the sunlight four or five hundred feet from the station. The lens and tube project through an aperture in the shutter of a dark room. The ray of sunlight reflected from the bulb passes through the lens, and is decomposed by a prism into a spectrum about three-quarters inch long as regards its actinic portion. It is received upon a photographic dry plate. If all the actinic portions are in focus, the spectrum will be photographed as a thin streak of uniform width ; but if the lens is not correct, the spectrum will taper off at one end or the other, indicating an erroneous shape.

In the other method a star is photographed. The lens is directed towards Polaris, and a number of exposures at slightly varying adjustments are made upon a dry plate. The exposures are made upon both sides of the focus. If the lens is perfect, the spots produced when the plate is out of focus are of even illumination. If the lens is imperfect, a dark spot can be discerned in the centre of some of them. The image of the star when in focus is, of course, a mere point ; the unfocussed image may be nearly an eighth of an inch in diameter.

Great skill is required in applying the results of these tests, whether visual or photographic. Upon them are based the corrections which impart to the lens its final character of perfection.

The tendency of the inequalities in an objective is to form circles. The location of these is determined by the visual or photographic tests, according to the class of lens under treatment The lens is removed and placed upon a horizontal stand, whose surface under the lens is ruled in circles. The proper one is selected as the guide, and the operator rubs the protuberant area with his fingers, using, as before, rouge and water. A few minutes or upward may be devoted to this. The lens is next, for a very short time, placed upon or under the pitch lap, and polished, and is then cleaned and re-tested. The testing requires more time than the rubbing. This process, repeated over and over again, extending, it may be, through many months, gradually brings the lens into shape.

The plane mirror used in the tests needs to be very perfect. They are much harder to grind than lenses, and are made by the Clark brothers for their own use. Such mirrors are also required in some astronomical work. As an illustration of the extraordinary degree of perfection to which their manufacture has been brought, the case of some manufactured for the government by the Clark establishment may be instanced. These were to be used in the observations of the transit of Venus. They were made with the guarantee that they were to be of eight miles radius of curvature as a minimum, and of the lot all exceeded this standard.

Although their objectives are what the reputation of the firm has been built upon, they also make the other portions of telescopes, furnishing them complete with all adjuncts, clock motion, and circles of graduation.

Although the thirty-six inch objective of the Lick telescope would seem a sufficient triumph, the brothers hope to be engaged to construct a still larger objective. They believe that they can make a forty-inch objective of as good quality and as perfect as those of the Washington or Lick telescope. The work exercises a sort of fascination or excitement upon the operators, and to hear the story of their work from themselves upon the ground of their achievements is inspiring to the listener.

We also present an interesting group of the three co-workers. In the centre, Alvan Clark, the father, appears. On the right of the picture, on his father's left, is George B. Clark, now the senior member of the firm. On the other side Alvan G. Clark is sitting. Two years ago death removed Alvan, the son of Alvan G. Clark, at the early age of fourteen years. With him the male line of the family was extinguished. His portrait, painted by the grandfather, shows strongly the Clark features.

Many of the paintings of Alvan Clark are still preserved in his old home. They include miniatures on ivory and portraits on canvas. They show that the lens maker was a skilful painter, his miniatures being especially beautiful. In the upper storey of the factory he had a sort of a studio, where, within a few years of his death, he still handled the palette.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Photo-Mechanical Printing Processes—Orthochromatic Plates for Landscape Photography—Orthochromatic Photography without Yellow Screen—Substitute for the Yellow Screen—Photographic Schools in Germany—Stern's New Printing Board—New Method of Preparing Transfers for the Zinc Etching Process.

Photo-Mechanical Printing Processes are extensively worked in this country. You will scarcely find an illustrated journal without one or two of their illustrations being of a photographic origin. By far the most, and doubtless the finest, photographical blocks are furnished by the renowned firm of C. Angerer and Goeschl, of Vienna. I have recently been favoured by this firm with a beautifully fitted up collection of "printing-proofs," containing proof illustrations of the different processes worked in this establishment. They are all of the highest technical excellence, but especially the chromo-photo-typographical prints deserve our warmest interest. They are imitations of water-colour paintings, possessing the great advantage over chromo-lithographic prints that they require for their production at the most seven colour plates, whereas the lithographer seldom gets out in the same style with thirteen colour-plates. I shall give some details of this beautiful process in a future letter; this time I will only forward you an autotype or phototype-block produced by C. Angerer and Goeschl, to illustrate my letter. It is a reproduction of a photograph of the same size.

Orthochromatic Photography has advanced to a high state of perfection, and its latest development, consisting in sensitising commercial gelatino-bromide plates just before exposure in a bath of erythrosin or azalin, has proved most useful. For the preparation of orthochromatic plates, the following formula, recommended by Prof. Vogel, answers well. For the reproduction of coloured subjects (paintings, industrial articles, and all subjects showing plenty of red), also for taking photographs of landscapes with yellow clouds, serves the following azalin bath :—

Azalin (1 per cent. solution) ...	20 parts
Water	80 "
Ammonia	2 "

The gelatine plates are allowed to remain in this bath one minute, then they are dried in the dark. They are exposed through a screen coated with a mixture of 3 parts aurantia, and 1,000 parts collodion, three to five times longer than if they were in a wet state. The plates, presupposed they are coated with a good emulsion, will keep eight weeks.

Orthochromatic Plates for Landscapes.—For landscapes containing a large proportion of green and blue (trees, fields, water, clouds, mist in the distance) the following erythrosin silver bath may be used :—

Erythrosin solution in water (1:1000)	50 parts
Nitrate of silver solution (1:1000) ...	50 ,,
Water	100 to 200 ,,
Ammonia	2 to 3 ,,

Filter. Dip the plates for a minute in this bath, and allow to dry. They will keep only seven days. They are twice as sensitive as the common gelatino-bromide plates, and will give excellent results, even without using a yellow screen. But they are not as sensitive for the red rays as azalin bathed plates. These plates are developed in the following solutions :—

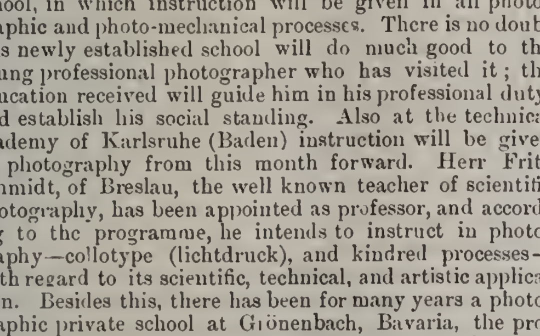
1.—Distilled water	...	500 parts
Sodium sulphite (neutral)	...	100 ,,
Pyrogallic acid	...	14 ,,
2.—Distilled water	...	1000 ,,
Carbonate of soda	...	50 ,,

For use, mix one part of No. 1 with two parts of No. 2.

Orthochromatic Photography without Yellow Screen.—As a substitute for the yellow screen, Herr Engler, court photographer of Dresden, applies with commercial orthochromatic gelatine plates collodion films, which are to be placed into the lens together with the stop. The stops are made of thin cardboard, and coated with a collodion film of a more or less yellow tint. They are prepared in the following manner. On a waxed and levelled glass plate, free from all scratches, a 4 per cent. solution of normal collodion, coloured with aurantia, is poured, and the film allowed to dry in a warm place. Then gum is applied to one side of the cardboard stop, and the latter pressed against the collodion film, allowed to dry, and then lifted together with the collodion film, after having cut through the film along the edges of the stop with a sharp penknife.

Photographic Schools in Germany.—More and more attention is given in this country to the fact that a scientific education of those young men who intend to embrace photography as a profession becomes a necessity. In a few months there will be opened at Vienna, under the direction of the eminent professor Eder, a photographic school, in which instruction will be given in all photographic and photo-mechanical processes. There is no doubt this newly established school will do much good to the young professional photographer who has visited it; the education received will guide him in his professional duty, and establish his social standing. Also at the technical academy of Karlsruhe (Baden) instruction will be given in photography from this month forward. Herr Fritz Schmidt, of Breslau, the well known teacher of scientific photography, has been appointed as professor, and according to the programme, he intends to instruct in photography—collotype (lichtdruck), and kindred processes—with regard to its scientific, technical, and artistic application. Besides this, there has been for many years a photographic private school at Grönenbach, Bavaria, the proprietor of which is the well-deserving photographer and collotyper, W. Cronenberg. In this establishment, beautifully situated in the midst of pleasant meadows, and in the sight of the Bavarian Alps, hundreds of scholars of all countries have received a most careful instruction in all branches of the old and new photographic process.

Stern's Printing Board.—J. Stern, of Munich, has invented a new form of printing board, which tends to do away with the heavy and expensive printing presses now employed to obtain paper positives. This instrument is composed of a wooden board, being hinged into two pieces, which has been covered with some soft material—as, for instance, with felt—and against which a glass plate, placed over the sensitized paper, is pressed by means of metal springs or levers. To each corner of the board is attached one of these levers, each of which consists of two arms of different length. The shorter arm presses against the glass plate, whilst the longer one can be turned, and bent by pushing it down to the pin, to be seen in the diagram. By reason of the considerable difference of the two arms, a great pressure is exercised on the glass plate, so that the negative and the sensitised paper will be kept tightly in position during the printing process. The idea, though not a quite new one, is well carried out, and the apparatus is likely to prove practically useful. It has been patented in Germany.



Transfers for Zinc Etching.—A new method of preparing transfers for the zinc etching process has lately been introduced by Jaffé and Albert, of Vienna. With the usual method of making transfers in greasy ink, it happens sometimes, in transferring the developed greasy image to the zinc plate, that the lines or dots of the image will be crushed and become broader. To prevent this, Jaffé and Albert have modified the process in the following manner. The image on the bichromated paper is developed in the usual manner with greasy ink, but, after the paper has been dried, it is dusted with a powder, consisting of a mixture of asphaltum, colophony, and wax, then the whites of the paper are freed from any adhering powder with the aid of a pad of cotton, and an alum solution is applied, in order to tan the gelatine on the paper, so that it may become hard, and not give way afterwards in the transferring process. The transfer is now warmed to a certain degree, and transferred to the zinc plate. It is not necessary to coat the print with greasy ink, and this is important. In this case we have a resin image on the metal plate, which offers sufficient resistance, so that we may commence with a strong first etching, by which the finest dots and lines of the image will all be preserved.

Notes.

The fact that the Photographic Society of Great Britain continues to do excellent work in the cause of photography well covers the blundering way in which it so frequently stumbles and re-stumbles over its somewhat complex rules and regulations, more especially the rules relating to the Exhibition; but all the confusion and discussion which occasionally arise do not seem to interfere one iota with personal good feeling in the Society.

We referred last week to the fact that a series of photographs which has, during the last month or so, been exhibited as an advertisement in most of the West-end gin shops was not only admitted to the Exhibition, contrary to one of the rules, but awarded a medal—an award more than justified by the intrinsic merits of the pictures. This week we may refer to the rule which excludes photographs coloured by hand, and ask our readers to look at the case of enamel photographs, many of which are hand-coloured, and that with a lavishness of the primary colours which by contrast would throw into dullness a rainbow, as ordinarily seen, although not quite coming up to the spectrum as projected on the screen at the Royal Institution lectures.

Then, again, the never-observed rule about the last day for receiving pictures was, perhaps, more than usually honoured as to non-observance this year, as the exhibits received after date really converted what would have been rather a bare show into quite a full exhibition.

On the Exhibition circular for 1885 there was printed in coloured ink a note to the effect that the rules would really be observed, the following being the text:—"*Special Notice.*—By order of the Council.—The rules and regulations respecting the Exhibition are to be strictly adhered to, therefore no picture or apparatus will be received after nine o'clock p.m. on Thursday, September 24th." Even then the regulation as to sending in was not observed. Perhaps next year the "Special Notice by order of the Council" will be re-issued, and at the same time a new rule be formulated, ordaining that the special notice be something more than the mock forfeits of a barber's shop in the time of the Tudors.

One of the aids to good fellowship in photographic circles is the Solar Club, which meets to dine monthly, during the winter season, at the Café Royale in Regent Street; and the opening meeting of the season, which took place on Monday last, was one more than usually representative. The Chancellor of the Club, W. England, prepared an agreeable surprise in the shape of an addition to the usual "card," consisting of a capital reproduction of the photograph of the members taken by Rejlander in 1869, and which photograph was issued with the Photographic News in 1884.

Two of the Patents held by the Cellerier Syndicate have just been made accessible to the public, and the specification of one of these (Browne) was published in the News last week, and the other (Parkes) will be found on page 651 of the present number. In the former the preparation and use of a coloured doublet for placing behind a transparent print is described, and in the latter the colouring of a transparent print at the back is treated of, but the claiming clauses do not specify what are the actually novel points of the invention; still, crystoleum painters and others who have been colouring at the back in various ways will not be likely to cease work through dread of legal proceedings from the owners of the above mentioned patents.

It is said that Walter Crane will deliver a course of lectures on the illustration and decoration of books, at the Society of Arts during the coming session; and many of our readers will, doubtless, be glad to attend the course. Every year photography increases in importance as a means of book illustration, while for the decoration of book covers permanent photographs have been pretty largely used by Zaehnsdorf and other eminent bookbinders.

Complete sets of the Photographic News, and of the *British Journal of Photography*—each paper going back over a quarter of a century—are not by any means easy to get, and it is to be regretted that a set of each was destroyed in the recent fire at Whiteley's, these sets having been got together by a member of the Camera Club at considerable expense of time and money.

We gather from a weekly paper that it has long been a subject for complaint by French artists that photographs, coloured and uncoloured, of their pictures exhibited in the Salon were publicly sold without the artists' leave, and to their manifest detriment. But by recent legal proceedings it is now made plain in France, at least, the artist is protected by the law. If French artists have only just discovered this fact, they must be much more indifferent to their rights than are their English *confrères*.

Book illustration in Chili some may say is progressing backwards. In England wood engraving is gradually giving place to photo-mechanical processes, in Chili the reverse is about to take place. We learn that the minister of Public Instruction has called upon the council of ministers to employ a minister of the highest skill and perfectly competent to introduce wood engraving into the country. All book illustrations, &c., have hitherto been done by lithography and photo-mechanical processes, and the minister contemplates the establishment of a school for wood engraving. Here is a chance for those unemployed English engravers who have been complaining so bitterly of the rivalry of photography.

We have noted on previous occasions that County Court judges, in cases of dispute between photographers and sitters, generally decide in favour of the former. This seems to show a knowledge of human nature, because, in all the arguments of the sitter, vanity plays a part. In America the same thing is observable. A recent action is a case in point. Max Meyer, a Bowery photographer, brought an action against a Mr. Weintandler to recover sixty-eight dollars, the cost of two "crayon busts" of himself and his son. The employers of Mr. Weintandler desired to give his wife a crayon portrait of herself, and as it was to be kept a secret from the lady, the difficulty was how to obtain her portrait without exciting her suspicions. To do this, Mr. Weintandler and his son had their photographs taken, and it was only natural that Mrs. Weintandler should have hers taken too. In the course of conversation, Mr. Weintandler expressed a wish to have a "crayon bust" of himself and his son made, and, according to Meyer, gave a definite order. He, however, contended that he did not go further than the wish. Anyhow, the "crayon busts" were executed; but when they arrived, Mrs. Weintandler declared that the portrait of her husband was "horribly ridiculous," and as for that of his son, "it resembled the face of a dog." We are afraid in this case the lady protested too much, for the judge gave a verdict in the photographer's favour for forty-eight dollars, striking off twenty dollars in deference to the opinion of a "professor" who had been called in to paint a second portrait of the lady, and who said he thought Mr. Weintandler's portrait could be made right for about twenty dollars, "though he wouldn't like to undertake the job."

The significant part of this action is that the defence is the common one of "not having ordered the portrait." It is curious how often disputes arise from the absence of a clear understanding on this point. Sitters ought to know their own minds, but it too often happens that from some motive which they never disclose, they are only too glad to slide out of the agreement if they see a chance.

Annan and Swan replied in last week's *Atheneum* to Professor Herkomer's strictures upon photogravure. They contend that photogravure is not the purely mechanical and chemical process which it has been supposed to be, and that it has already done engravers and their art a great deal of good. Messrs. Annan score a point when they say it would have been impossible to have got an engraver for Sir Noel Paton's picture of Oberlin and Titania (reproduced by them in photogravure), on account of the number of figures in it; and Sir Noel himself said that photogravure was the only method by which it could be adequately rendered.

In another column (p. 642) will be found a notice of the Photographic Exhibition taken from the *World*, and the critic raises a point worthy of consideration. Why do not photographers take and exhibit composite portraits? By producing composite portraits according to the Galton method the photographer might compete more fully with the portrait painter in giving some sort of average expression of a sitter. The photographic portrait is usually an exact representation of one phase of expression, and is often a bad likeness for this reason, while the skilful painter's representation is a composite of numerous expressions, and often is a more really characteristic likeness. Not only could composites of the same individual be made, but family composites, and these latter would probably have a large sale if well introduced.

A well known professional who has distinguished himself in marine photography availed himself of a hint we gave some time ago, and obtained one of Dallmeyer's new single rapid lenses for his seascapes. Soon after, an amateur acquaintance—whose exceptional work he had just begun to view uneasily—came around and noticed the new lens. The professional would not communicate that which he had learned from the News, and endeavoured to mislead the amateur as to the instrument, but the latter gathered that it was one of Dallmeyer's. Sauntering away with his hands in his pockets he went to the telegraph office, and wired for "Similar lens to that recently supplied to ——, but for 24 by 18 plates." The Casuist may find several points for consideration here, especially as to the justice of attempting to monopolize knowledge derived from a public source.

Since the arrest, in connection with the latest French scandal, of Madame Limouzin—the lady who, though lame, and a dwarf, and a hunchback, seems to have possessed considerable power of fascination, which she has seemingly used to no very good purpose—her drawing room has been visited by a number of Paris reporters, who have taken as minute an inventory of the apartment's contents as though they had been broker's men rather than journalists. Especial care has been shown by them in noting the numerous photographic portraits which were displayed in various parts of the room, most of them being likenesses of Frenchmen of position. One ingenious journalist even went so far as to build up a theory of the degree of friendship existing between M. Limouzin and the originals of the photographs she possessed, founded on the relative value of the frames in which their portraits were enclosed, and the position in the drawing room accorded to them. Thus it was demonstrated, or rather argued, that General Thibauder, seeing that his photograph was in an expensive plush frame, which was put on the place of honour on the top of the piano, must have been of all the lady's acquaintances the most favoured. The likenesses of generals and statesmen in comparatively cheap frames, and displayed in comparatively unimportant parts of the mantelpiece, or on occasional tables were, it was contended, only those of less valued friends and acquaintances. So far so good. Still, surely the top of a piano is not the place on which a fascinating lady would display the portrait of her dearest friend. No, no; the French reporter ought to have known that the place of honour is in a locket worn near the fair owner's heart.

It is to be hoped that a fashion started by the *Philadelphia Weekly Press* will not extend to England. This enterprising journal has been analysing the photographs of its public men, confining, however, its attention to their noses, and publishing outline drawings of this prominent feature. The remarks are exceedingly candid, and not always complimentary. But American journals are still as Martin Chuzzlewit found them, "horribly personal." We have not got so far in our descriptions of our revered statesmen as to say of one that he has "a perfect bowsprit of a nose;" of another, that "his nose is broad and flat on the back, but draws in a bit at the nostrils;" and of a third that his nose "started to be a hooked nose, but failed in effecting its purpose." The prospect of being subjected to such minute criticism should make celebrities dread being photographed.

DEVELOPING FORMULÆ.

COMPILED BY MESSRS. LYONEL CLARK AND E. FERRERO, FOR THE CAMERA CLUB.

At the request of one of the members, the committee of the Camera Club decided to make an analysis of the developing formulæ issued as instructions with the different brands of dry plates. Messrs. Lyonel Clark and E. Ferrero were appointed, and the results of their labours will be found on the next page.

It was decided to take the ounce as the unit, and the quantities of the chemicals contained in such a bulk of solution in grains or minims. The metrical system has not yet taken sufficient hold of the photographic world to justify the estimation in grammes, &c.

In order to ensure the utmost accuracy in these analyses, the makers of the plates have in all cases been communicated with, and their opinion ascertained as to their correctness. It is gratifying to observe that all the best known makers have responded to the call. Formulæ which have received such ratification from the makers have been marked with an asterisk.

AMMONIA DEVELOPERS.

PLATES.	Pyro. Grains.	Ammon. Bromide. Grains.	Pot. Bromide. Grains.	Ammonia. Minims.	Sodium Sulphite. Grains.
*Abney and Derby	2	2 to 4	—	1·60 to 4	—
*Academy	2	2	—	4	—
Albert	1·50	0·63	—	3·16	—
*Britannia	2	2	—	4	—
*Cadett's	1·50	3	—	6	—
Charterhouse	1·36	3·40	—	1·36	2·72
Ctaubourne	1·10	-	0·72	2 30	4·40
*Derby	2	2 to 4	—	1·60 to 4·00	—
Derwent No. 1	2	0·12	—	2·33	—
„ No. 2	2·45	—	1·22	2	
*Eastman's Stripping Films	2	0·50	—	3	2 Meta-Bisulph. Pot.
Edwards's XL	2 10	0·50	—	2	
*England's	1·50	--	1	2	—
Elliott and Fry's	2	0·30	—	1 to 1·30	—
Elliott's	3	1	—	3	—
Do. Extra Special	2	1	—	3	—
Do. Dragon	2	2 80	—	3·75	—
Facilis	2	2·50	—	4·50	—
*Fry's German (Dr. Eder's)	2	—	0·57	2	—
* Do. Kingston Special	2	0·71	—	2	—
* Do. Do. Instantaneous					
German (Sands and Hunter)	2·14	—	0·23	1·87	—
*Globe	2	1	—	4	—
*Ilford	1·85	2·50	—	4·50	—
*Lancaster's	2·40	—	0·83	5	—
Ludgate	2·14	—	0·23	1·87	—
*Manchester, No. 1	2	Bromide to Ammonia as 1 is to 4.			
Do. No. 2	2	1·50	0·75	3	6
Do. No. 3 Sulpho-Pyro	2	0·90	0·46	1·80	—
Mawson and Swan's	1·50	0·75	—	3.75	—
Do. New Cheap	1·50	1·50	—	3·75	—
Do. Photo-Mechanical and Lantern	1·50	0·75	—	3	—
Mawdsley	1·50	—	0·50	3	—
*Miall's	3	0·25 to 0·50	—	2·50 to 4	—
*Midland	2	0·20 to 0·40	—	0·60 to 4	—
*Monckhoven's	1·25	1·50	—	2 to 4	—
*Morgan and Kidd's	2	0·25	—	1	—
* do. Richmond	2 or more	0·20 or more	—	0·83 or more	—
National	2·53	—	1·50	2·30	—
Nelson	2	2·90	—	11·33	—
*Paget's	1·82	0·45	—	2·50	7 29
Premier	2	2·50	—	3	—
*Rouch's	1·26	1·26	—	3	5·04
*Soho	1·90	1·25	—	2·25	—
*Thomas's	1·08	1·08	—	2·40	4 32
*Trafalgar	1	—	1	1·50	—
Ordinary	2	—	0 33	2·50	—
*Wratten and Wainwright's Instantaneous	3	—	0·33	2·50	—
*Wratten and Wainwright's Special Drop-Shutter	3	—	0·62	2·50	—

SODA DEVELOPERS.

PLATES.	Pyro. Grains.	Ammon. Bromide. Grains.	Pot. Bromide. Grains.	Sodium Carb. Grains.	Sodium Sulphite. Grains.
*Beernaert	4·78	—	—	16·05	32·10
*Eastman Paper Negative	4·50	—	—	19	27
Do. Stripping Films	4·50	—	—	19	27
*Manchester, No. 5, Sulpho-pyro	2·00	—	0·12	4	—
Mawson and Swan's	1·00	—	0·50	14	21
*Obernetter	0·80	—	·20 to ·50	7 to 10	40
*Vogel (Obernetter) Azaline Plate	1	—	—	7·5 to 11 25	50
*Wratten and Wainwright	3	—	—	18	18

POTASH DEVELOPER.

PLATES.	Pyro. Grains.	Ammon. Bromide. Grains.	Pot. Bromide. Grains.	Pot. Carbonate. Grains.	Sodium Sulphite. Grains.
*Abney and Derby	3 60	—	—	22	18·88
*England (Instantaneous)	3·40	—	—	8·60	17
*Frœdman Tissue	3·33	—	—	8·75	22
Keystone	2·50	—	—	6·41	10
*Manchester (Sulpho-pyro)	2·00	—	0·12	4	—
Mayfield Special Favourite	3·40 to 5·10	—	—	12 to 30	21·60 to 40·40
*Thomas	2·25	0·11	—	9·37	6·75

MIXED DEVELOPER.

PLATES.	Pyro. Grains.	Sodium Carb. Grains.	Potassium Carb. Grains.	Sodium Sulphite. Grains.
*Eastman Stripping Films	3·53	12	3	21·18

CARBONATE OF AMMONIA DEVELOPER.

PLATES.	Pyro. Grains.	Pot. Bromide. Grains.	Ammon. Carb. Grains.		
*Beechey Dry Collodion	12	3	30	—	—

Patent Intelligence.

Application for Letters Patent.

13,505. James Henry Jefferies, 169, Fleet Street, London, for "Improvements in apparatus for washing and drying photographic negatives and photographic pictures on glass, part of such improvements being applicable also for washing photographic prints."—October 5, 1887.

13,725. James William Thomas Cadett, Greville Works, Ashstead, Surrey, for "New or improved means for setting or cooling photographic emulsions on glass or other suitable materials used as a support for photographic emulsions."—October 10, 1887

Notice of Amendment.

In the matter of Letters Patent granted to William James Lancaster, of Colmore Row, Birmingham, in the County of Warwick, for the invention of "A new or adjustable diaphragm for photographic cameras," dated the 19th day of March, 1886. No. 3879.

Notice is hereby given that on the 28th day of September last, leave was granted for the amendment of the Specification, No. 3879, of 1886, in the manner set forth in No. 375, of the Official Journal of the Patent Office, issued on the 6th day of August last. The Specification has been amended accordingly. Dated this 8th day of October, 1887. H. Reader Lack, Comptroller-General.

Official Abstract of Accepted Complete Specification.

9965, 1887. Garthwaite, for "Printing, colouring, and finishing." Eggs for albumenizing paper prepared by whisk which acts by squirting and churning.

Specifications Published.

13,549. Warwick Brookes, of 350, Oxford Road, Manchester in the County of Lancaster, Photographer, for "An improved photographic camera."—October 23rd, 1886.

The Patentee says :—The body of the camera is in the form of an oblong box provided with a rabbet at the back to receive the ground glass focussing frame and the dark slide. There is a recess at the bottom of the camera to contain the focussing frame when not in use. The back is hinged at the top, and is provided with two side pieces, so that when raised it forms a hood, so as to dispense with the necessity for a focussing cloth. The shutter of the dark-slide is hinged to the frame, and it is provided with a slot and a band, beneath which (as the slide is placed in the camera) the end of an arm or lever is passed. This arm projects from a rod passing across the body of the camera (inside), and provided with a turn-button on the outside, so that when the slide is placed in position the sensitized plate can be exposed by turning this button so as to cause the arm to open the hinged shutter inside the camera. An opening is provided in the back, through which the shutter can be fastened or unfastened after it is placed in the camera, and the back shut. The lens is fitted to the front of the camera, and the focus is taken by moving the same to or fro by means of a turn-button outside, the said button being fixed on a rod at the other end of which is a pinion taking into the rack of the lens. In front of the lens is a frame hinged from above, and carrying the instantaneous shutter, and when longer exposures are required this hinged frame can be opened and closed, so as to act as a cap to the lens. This instantaneous shutter is of the revolving type, and is released by a small catch underneath the camera. The camera is fitted with a "view-finder," which consists of a hinged frame on the top near the front, and a movable arm or strip pivotted to the back and made with an eye-hole. The hinged frame of the "view-finder," when shut, lies in a recess on the top, and incloses and holds down a movable card or paper slip, upon which memoranda of the subjects and exposures can be made, and a small spring is also provided for holding a pencil to be used for that purpose. The camera may be held in the hand close to the cheek, and by looking through the "view-finder" the subject may be followed and the instantaneous exposure of the plate made at the proper time by pressing the catch, or if a longer exposure is required it is provided with a screw for attaching it to a stand.

13,620. Alfred Walter Dollond, of 66, Hurlingham Road, Fulham, in the county of Middlesex, Clerk, for "Improvements in tripod camera stands."—Dated 25th October, 1886.

The patentee says :—My invention relates to tripod stands for supporting photographic cameras or scientific instruments. For convenience in use such stands may have legs adjustable to various lengths. I make the upper portion of the legs of my stand in any of the forms usually found convenient. I prefer those forms in which the upper portion of the legs consists of two rods or laths, formed at the top so as to engage with the tripod top. At the lower end of the upper portion of the legs I fix a block pierced with a hole through which the lowest length of the legs slides up into or beside the upper portion. In order that the legs may be conveniently fixed at the required height I make the lower or sliding portion of the legs in my stand of rods of a spiral, curved, or snail shape in section ; that is of a form such that, as the leg is turned completely round on its axis, the outer surface continually recedes from that axis. I make the hole in the block, through which the leg slides, of a corresponding shape, and of such size that the leg may slide easily through it.

While the leg slides in the hole in such a position that the form of the leg and that of the hole correspond, the leg may be slid up through the block or drawn out very readily. When, however, the leg is revolved on its axis, so that the most projecting portion of the leg encounters the decreasing surface of the hole, it jams and becomes fast.

Therefore, in use, the sliding portion of the leg is withdrawn to the required extent, and then partially revolved on its axis until it becomes fixed with a firmness corresponding to the amount of force employed in revolving it.

The leg is unfixed by revolving it in the opposite direction, and may then be easily slid completely into the upper portion, and is ready for carriage.

The sliding rods of the form described may be applied so as to form the lower part of the legs of stands with several folds.

The legs may, if required, be made of metal tubing of a form so that one portion slides within another, provided that the tubing is of the curved or spiral form described.

14,120. Edward William Parkes, Salters Hall Court, in the City of London, Gentleman, for "Improvements in the production of coloured photographic pictures."—Dated November 2nd, 1886.

According to this invention, after having taken a negative in the ordinary way, and produced a positive either by the carbon or other similar process, I fix the same with the reverse side of print on glass, opal, porcelain, egg shell, glass, or other similar material, as a support which has been previously waxed, or French chalked, and collodionized. I prefer opal, egg shell, glass, or porcelain, inasmuch as the photographic printer can the more readily discern the quality, and various shades and tones of the print required, insuring more general similarity of light and shade when a number of copies is required, and the painter or colourist can the more easily trace the lines and depth of colour required without the assistance of a paper support, desk, or othe. accessory, thereby securing more accuracy of detail in colours Again, the egg shell glass and finely grained opal or porcelain impart to the photograph a very artistic and highly finished appearance, saving the labour and expense of rolling as usually adopted with photographs on paper or similar substances. The print is then developed on such support, after which it is allowed to dry, and the pellicle receives the required colours in flat tints (either oil or water colours), these colours being first suitably prepared ; *i.e.*, if oil colours (which I have found preferable) are used, I add a substance to bind the colours, that is to prevent the colours from running into one another, and the medium I have found answer best in practice is three parts best terebene, one part pure mastic, a few drops of oil of turpentine thinned with ordinary spirit of turpentine. At times I add amber and best copal varnish in proportion of one to twelve, or japanned gold size diluted with oil of turpentine. In the case of water colours being used, I employ sufficient oxgall or similar medium for a like purpose.

I have found oil colours more suitable to my process, as I can lay the colours more flatly and evenly, and infuse the colour into the film by means of the fleshy part of the fingers, or by using a stippling brush pad, or similar contrivance, the brush having a tendency to cause unevenness and irregularity in the substance of the colour, and destruction of the film, which must necessarily destroy the value of the photograph. I then pour over the film and colour, slightly warming them, a solution composed of and proportioned as follows :—One part of borax dissolved in twelve parts of boiling water, to which I add an equal quantity of varnish made of white lac, or similar substance, and methylated spirits in the proportion of one to three. This operation fixes the colours, and removes all greasiness of oil colours and bubbles, pimples, and peeling off of the film, which otherwise occurs when the transfer is effected without this precaution. If japanned gold size with oil of turpentine has been used in the earlier part of the process, the use of the fixing solution may be dispensed with unless the colours employed are of a vegetable character, when it should still be applied. A permanent support of paper sized and starched, or the ordinary transfer paper, is then affixed to the pellicle by damping the paper in cold and warm water alternately, sufficient to cause the pellicle to adhere to the said last mentioned support.

The pellicle and paper forming the support for the pellicle are allowed to dry thoroughly, and then stripped from the glass and mounted on cardboard, opal, glass, porcelain, or other similar suitable strong and permanent support, the result forming a permanent and highly finished photograph in colours.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I would remark, in conclusion, that I am aware of several attempts having been made to produce coloured photographs by painting on the back of a carbon or other pellicle, and by afterwards stripping the coloured pellicle from the supporting glass, but all such attempts have proved practically unsuccessful; but what I claim as my invention, and desire to secure by letters patent, is:—The improved method, substantially as hereinbefore described, for the production of coloured photographic prints on a carbon or other equivalent film.

14,262. Henry Park, 1, Orchard Buildings, Kingsland Road, in the County of Middlesex, Photographic Apparatus Manufacturer, for "Improvements in the construction of photographic cameras."—Dated 5th November, 1886.

The Patentee says:—I form the base board in two parts, the lower half of the board being made solid, and the upper (sliding) half being a rectangular frame, provided with rabbets and racks, as usual. The upper part of the base board is made to slide forward upon the lower base board.

The lower base board is fitted on each side with a metallic groove or slot. In each of these slots I fit a slide bar, which carries the lower centre or pivot of the radial bar or link, and also a vertical bracket and a set screw. The set screw is used to fix the position of the slide bar in the slot, and the bracket is fitted with a screw which forms one of the pivots for the back board.

The focussing pinion is fitted to the lower base board, and the front plate is fitted to the upper base board, to which it is fixed in any required position by set screws and nuts.

The bellows body is made parallel, and is attached to the front and back plates in the usual manner.

The main features of novelty in this invention are, the outside metallic grooves in the base board; the slides which work therein; the brackets attached thereto carrying the working centres of the back board, this back board having double swing motion, which allows the back part of the camera to be put in any position on the base board, as required, when wide-angled lenses are used, readily and without detachment; also the adjusting links; also the means of folding the camera (no hinges being used), and the protection afforded to the focussing plate by the solidity of the lower base board, when packed.

14,421. John Edward Thornton, of 3, New Lorne Street, Moss Side, Manchester, in the county of Lancaster, Printer, for "A holder for lens-diaphragms in cameras."—November 9th, 1886.

The Patentee says:—The object of this invention is for the purpose of dispensing with the necessity for having a loose case for the reception of lens-diaphrams or stops, such as is usually carried in the pocket. In carrying out this invention I form a receptacle, which I call the diaphragm-holder, which may be a plate having its edges turned over on three sides to hold the diaphragms in position, leaving the top open so that the diaphragms may be readily withdrawn. A spring, having a projection attached, is made to press against the diaphragms, and the projection, passing through the holes therein, prevents them being withdrawn till the spring and projection are pressed out of the way. The holder may be made of metal, ebonite, or other suitable material, and may be attached to any part of the camera in a convenient position. In some cases I prefer to place it on the camera front near the lens, but generally I prefer to place it on the side of camera body. If desired, the holder may be formed in the woodwork, by recessing or cutting it out, or in any other way which may be preferred.

THE CAMERA AND ITS IMPROVEMENTS.*

BY G. G. MITCHELL.

If some one, well informed on the subject, would write a descriptive paper giving a general idea of the principal improvements on the camera introduced within the last ten years or so, without any suspicion of puffing particular makers or patents, he might do the photographic world considerable service. Nearly the whole of these improvements or modifications, I presume, claim to be the subjects of patents; but it might be a useless labour, and not by any means worth the pains required, to describe very many of them, for it is only too apparent that hundreds never get beyond their author's approbation, and remain in cold neglect, forgotten either from want of original merit, or because their object is already sufficiently attained by existing apparatus.

The claims of rival makers are constantly pushed before us; but without having the actual apparatus in hand to examine, it is a matter of considerable difficulty to determine from mere woodcuts and advertisement descriptions which is the instrument we should prefer as best suited for our particular wants.

In a general way, there is a strong family likeness between the cameras of all the leading makers, so far as principles of construction are concerned. It is in matters of detail and compactness of arrangement where striking and sometimes very important divergencies are found, and it is chiefly in determining the comparative value and usefulness of these competing movements and arrangements that the purchaser finds himself hesitating to come to a speedy conclusion. Many have become possessors of a dozen of lenses, but few indeed must have purchased a dozen different cameras. The camera, for obvious reasons, therefore, is not known to the same extent as the lens.

I am not qualified to write the paper which I have suggested, but would simply make a few observations on what I consider some of the requirements of a good camera for out-door work, the result of observation and what experience I have had in the field, and also to notice some of its modern improvements.

In the first place, it seems to me that a good camera should be, so as to speak, one and indivisible. It should have no loose parts, no loose screws, no struts, nor base boards, nor, in fact, anything whatever which belongs to it as a camera proper. A photographer has ample to do when he gives his undivided attention to making a good picture, let alone burdening himself at every move with anxiety lest he should leave this or that indispensable adjunct behind him. Loose parts mean annoyance, and possible disaster. The camera made up in that way will almost certainly be a source of grief some time other to its owner, who will probably, one day, come within an inch of hastily separating it into more loose parts still. Having been badly bitten in my time, I speak feelingly. There is no excuse whatever, now, for an ordinary camera not being made self-contained when it is wanted; and if a maker is unable at this time of day to make it so, he must risk his customers occasionally confounding him and all his works. When there are no loose parts we lift the apparatus for an outing with a confidence and freedom from care which immensely adds to the pleasure of using it. It goes without saying that a camera should be as light as possible when it has to be carried now and again for a mile or two, but strength need not be unduly sacrificed to this, else its use in the field will be short-lived. Much must always be left to the taste of the individual, but it is manifest that the Kinnear form, especially in larger sizes, must be a great saving of weight, and unless some very special advantage attends the full-sized front, it would only seem sensible to adopt the conical bellows, with its attendant diminution of bulk.

(*To be continued.*)

Proceedings of Societies.

Photographic Society of Great Britain.

The adjourned special general meeting to consider the proposed new laws of the Society was held on Tuesday, the 11th inst., in the Exhibition Gallery, James Glaisher, President, in the chair.

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* A communication to the Edinburgh Photographic Society

Rule X., Clause 22 (see page 478), was further discussed, and an amendment that the Council issue a house list nomination was, after much debate, negatived.

Decisions were recorded in favour of the following amendments:—That the number of attendances at Council meetings be printed and sent to each member previous to an election; that members be privileged to nominate twenty names as candidates for councillors, and four candidates for vice-presidentship; that the names of nominators and their nominees be published.

An amendment to disqualify all members of Council from service in any office for one year after having sat in council for three years consecutively was lost.

The meeting was further adjourned to Tuesday, 25th inst., at 6 pm. Further details of the discussion will appear in our next issue.

CAMERA CLUB.

THURSDAY, 6th October, was the first technical evening of the winter session at the Camera Club. ALFRED DEED occupied the chair. A paper, entitled "Where go, what take, and some other matters," was read by W. Adcock, who, in opening his subject, referred to articles which had appeared in the photographic journals as to where to go with the camera. He held it absurd to go far away in search of work when it was to be found close at hand, and he then dwelt upon the beauties and opportunities, as he saw them, in public resorts in London, such as Regent Street being re-paved, and Trafalgar Square on a summer's day. He hoped that some who did not care for rustic scene hunting would think out subjects of an order that should employ some invention, some pre-determined arrangement, and that they would devote themselves to the production of figure pictures, representing, if not dramas, at least minor episodes of real life. He had been charged with having a liking for somewhat vulgar subjects. He hoped in his treatment he had done something to refine them. Incidents of low life, the sorrows and struggles of the poor, had been pourtrayed by great painters—by some to the entire exclusion of all other subjects; and the vulgarity or refinement of the work was dependent upon its treatment by the artist. He saw no end to what might be done practically, whether by quick shots at groups, or by arrangement with individuals, for posing to carry out subjects determined on. He insisted on more interior work being done, and advantage taken of the fine interiors available in London. He then referred to landscape work, and apprehended that many photographers in the future would give the same thought and care to a subject as a Graham or a Vicat Cole. Very few exposures would be made, but the parts of the picture would be carefully studied and composed, and a far larger size than at present would be worked. He had a belief in a direct picture as distinct from an enlargement. One point he wished to emphasize, the desirability of using a plate less square, particularly for figure work. Plate makers should keep in stock sizes in which the breadth was to length as one to one and a half. In conclusion, the lecturer drew attention to the use of plain salted papers, and described his method of sensitising them. He also showed pictures upon grocer's tea paper, treated in this way, and rough prints upon blue paper.

The CHAIRMAN, in opening the discussion, spoke of the difficulties of working with anything but a detective camera in the streets of London. He had had some experience of the persistency and curiosity of a London crowd, and would not advise the planting of a camera in Regent Street. One point he hoped would receive full discussion, that of the respective advantages of large direct work and enlarging from small negatives.

D. P. RODGERS was all in favour of small cameras and enlarging, except for large heads. Apart from the convenience of light weight and ease of manipulation in the field, small lenses were better in working than large ones. He found he could use *f* 22 instantaneously with his small lens in the country and secure good exposure, where the large lens gave but a very faint impression on the plate. He thought he could show some enlargements from quarter-plate to whole-plate and 12 by 10, which could not be distinguished from direct work.

G. DAVISON highly appreciated Mr. Adcock's address, but felt that he had been taking Londoners to task for overlooking work to their hand, without very fully seeing the difficulties of such work for men with daily avocations in town. Then, again, the detective camera was not very likely to help one to works of art, though it might lead to very interesting bits being secured. He agreed with Mr. Adcock that there need be nothing vulgar in the treatment of low-life subjects, and also in his remark "how little it takes besides the treatment to make a picture"; but he thought Mr. Adcock ought to have added "how difficult, how impossible, it is to command this treatment." It was easy enough to recognise sentiment, pathos, or humour, in a subject, and also to fix it so as to secure interested attention from people of a sympathetic turn; but to treat the material so as to produce a work of art was a different matter, and not more than one or two photographers had anyway approached success in it. In regard to interiors Mr. Adcock had said "no other than a wide angle lens was suited to interiors of much depth." He should have said that it was particularly in interiors having little depth that the wide angle was most essential. He did not think that enlarging would displace large direct photographs in artistic work. A picture generally had a scheme, and was worked out in minutest details, and enlarging would probably be felt to disturb the elements or alter the feeling conveyed by the work.

Mr. BLANCKENSEE had tried some of the very work suggested by Mr. Adcock in Regent Street, but all his plates had proved under-exposed.

Mr. SAGE did not like enlargements, nor could he advise outdoor work with a huge camera, unless the operator enjoyed such chaff as an advice "to get inside and pull down the blind," &c., to which he himself had been subjected.

LYONEL CLARK was in favour of enlarging. He did not like sharpness in any one part of the picture or plate, but preferred a certain amount of fuzziness all over the picture. For instance, he would draw attention to one of Mr. Byrne's large direct heads now in the exhibition at Pall Mall (a portrait of an old gentleman), where the near part of the figure was sharp and detailed, and every hair clear as the lines on a small scale map, and the off side was a snowy blotch. He thought he would have done better to have taken the portrait small, and to have enlarged it. The small lenses were much easier to construct, and gave greater depth of focus, if he might use that expression, which was really a misnomer, and meant a want of definition in any one plane. He then instituted a comparison showing that the enlargement from work done by a small lens would be expected to be sharper on the whole than that same large size done direct. He should suggest enlarging by daylight, and with the same lens as the small negative was taken with. He thought the best plan was to make an enlarged positive, say to 12 by 10, and then to copy again down to 10 by 8, that being the size required. It was impossible to get glass plates close enough together to make the transparency and final negative by contact. It would often be found that the best enlargements would be obtained from the poorest negatives, at least from the over-exposed ones.

The CHAIRMAN said that a serious objection that might be taken to enlarging was that it meant a great deal of work.

Mr. RODGERS found that his enlarging was done very expeditiously with a lantern with large condenser, which he kept ready at all times for working with the oxy-hydrogen light. One point of interest he would like to raise (it was one he was at present uncertain about): whether a better result were obtained by direct enlargement upon paper from a negative, or by making an enlarged negative.

The CHAIRMAN then called on the reader of the paper to conclude the discussion, and

Mr. ADCOCK went over the remarks that had been made, and met certain objections raised by the speakers. One point he was glad to find such general agreement upon, and that was the need for an alteration in the proportions of dry plates, and for the more general keeping in stock of the oblong forms of plates.

On Thursday, October 20th, at 8 o'clock, lantern slides will be exhibited. Mr. Brooks will show an interesting series of interiors of Windsor Castle; members will also be expected to bring slides for exhibition.

NORTH LONDON PHOTOGRAPHIC SOCIETY.

AT the meeting held on October 4, at Myddelton Hall, J. TRAILL TAYLOR in the chair, L. MEDLAND asked the cause of some curious transparent spots which had appeared on some of his plates after fixing.

J. JACKSON suggested that the defect might have been the result of using the fixing bath too strong.

The PRESIDENT thought that if a strong fixing bath had been used the defect might be caused in the washing, by the change from a dense liquid to a rarer one, in the same way that blisters are produced on albumenised paper prints.

F. G. Reader inquired if anyone had had any experience of the use of zinc hypochlorite for eliminating hypo.

J. Jackson had used chloride of zinc, but he found that it made the prints a bad colour.

In a short discussion on stripping films and paper negatives, the President said that a paper negative squeegeed on to ebonite had been sent him by Capt. Murray, who wished to know how to strip it from the ebonite; it was found impossible to do this by the ordinary means Capt. Murray had, however, since written to the effect that he had been successful in treating similar refractory cases. He found that warming the ebonite would enable the negatives to be stripped easily. The President had tried the means suggested with complete success.

Mr. Medland gave a most interesting and amusing account of his trip to and photographic adventures in Norway, Sweden, and Russia.

The next meeting will take place on October 18, which will be a lantern night, when visitors are invited.

London and Provincial Photographic Association.

An ordinary meeting was held on the 6th inst., J. Traill Taylor presided.

J. Robinson described and exhibited his improved camera, which he stated to be lighter and more portable than any he had seen. The Chairman and others failed to distinguish any points of novelty in the camera which could not be found in the older forms of the Kinnear pattern.

L. Medland gave an account of his recent exploits with the Russian Police while endeavouring to photograph public buildings in St. Petersburg. He made several successful exposures, notwithstanding the fact that he was virtually under arrest. In Moscow he was not interfered with, and brought away a gross of negatives illustrative of Russian life and surroundings. A large number of prints from the negatives were shown, also a series of Stockholm and neighbourhood. Mr. Medland urged the members to keep away from Russian territory unless they wished to be regarded as spies. Sweden, on the other hand, would be found to abound in camera subjects. The people were kind, and no obstacles were offered to the progress of the tourist photographer.

C. H. Trinks fully supported the sentiments expressed by the previous speaker respecting the pleasure derived from a trip to Scandinavia. Perhaps, he said, they allowed visitors to photograph the fortresses because they had no secrets to divulge.

The Chairman said that in France the authorities had stopped the photographic operations of W. H. Harrison, and an agent called on him (the Chairman), to enquire whether Mr. Harrison was taking photographs for publication in the *British Journal of Photography* He believed it was the intention of this Government to stop the photographing of the home fortresses.

R. Keene said he was not allowed to use a camera near the fortress in Edinburgh this year.

A question, "How to get rid of mercury from a negative which has been intensified therewith?" was read.

A. Mackie replied: If the questioner means how to get rid of intensity, he should immerse the negative in the fixing bath.

C. H. Trinks spoke in favour of the new micro objectives constructed at Jena, from the formula calculated by Professor Abbé Two examples were handed round for inspection, and Mr. Trinks stated that he obtained details in certain diatoms which was not otherwise possible. In effect, he had the benefit of a high power combined with a large aperture.

The Chairman said the new optical glass was under test with a view to its introduction into photographic objectives of large dimensions; and some idea of what the lens of the future would be could be gathered from his paper read before the Manchester Society. He then briefly described the construction of the Welsbach incandescent gas burner, in which the metals zirconia and yttrium are placed in the flame to render the light more brilliant.

W. Winter employed several of these burners, and was very pleased with the light. He promised to bring them to the Society on the 20th inst.

Edinburgh Photographic Society.

The ninth ordinary meeting of the current session was held in the Professional Hall, 20, George Street, on Wednesday, 5th October, at eight o'clock, the President in the chair.

G. G. Mitchell read a paper on "The Camera and its Improvements" (see page 652), which was followed by discussion.

John M'Kean, while deprecating the injudicious use of the swing back, thought it almost indispensable in the case of groups, in order to secure the best definition possible where the sitters were ranged behind each other. He had exhibited a ready means of fixing the camera on the tripod before the Society ten years ago. The present screw system was clumsy.

James Crighton thought a good camera should not be in separate parts. On one occasion he lost the triangle screw, but supplied its place successfully by an improvised one of hard wood. He thought the hint might be useful to loose screw people.

J. Patrick found the swing back extremely useful in street views. A variety of movements were valuable when the operator knew perfectly how to use them .He thought the bellows should, if possible, always be made to move with the sliding front.

Jameson, said the rising front could not always do the same work as the swing back. Both were useful to possess.

C. Inglis made frequent use of the rising front; sometimes he could not raise it so much as he desired.

T. Shawcross suggested that members should bring their cameras on a subsequent evening, and compare notes. It would be interesting to have such a show of apparatus as could be made.

W. Forgan described a tripod screw invented by M. J. Leunie, which was always attached to the triangle. The screw is formed by the well-known method of cutting away two or three threads at the neck, thus enabling it to be turned round when screwing on the camera. It is kept from falling out by means of a small brass plate tapped with the same thread as the screw. He did not approve of the bayonet joint as applied to lenses. Nothing appeared to him so satisfactory as a well-cut thread. The "Kinnear" bellows was a great boon where portability was in question. For this invention we were indebted to a distinguished member of the Edinburgh Society. He thought that some cameras were overloaded with brasswork, much beyond what was necessary for rigidity.

J. M. Turnbull exhibited an improved washing-machine, in which the prints were kept separated between frames laid over each other, as in Mr. Peter's apparatus, brought before the Society nearly twenty years ago. Mr. Turnbull proposed to empty the vessel rapidly; the water entering from the bottom and lifting the prints from their cord supports as it rises. Large work was thoroughly washed by such a machine.

Sheffield Photographic Society.

The annual meeting was held on October 4th, in the Masonic Hall, Surrey Street. An excellent dinner having been partaken of, W. B. Hatfield took the chair. There was an excellent attendance of members, and after routine business the election of officers took place as follows:—

President.– Councillor F. Firth.
Vice-Presidents.—T. S. Yeomans, and A. S. Platts.
Treasurer.–Chas. Yeomans.
Hon. Secretary.—J. W. Charlesworth, 227, Cemetery Road.
Assistant Secretary.—E. Beck, Norfolk Row.
Council.—W. H. Bacon, Joseph Taylor, Jonathan Taylor, T. G Hibbert, and W. B. Hatfield.

A vote of thanks to the retiring officers was passed, and a special vote of thanks was given to Joseph Taylor, the retiring hon. sec., for services rendered during a course of many years.

The balance sheet showed a satisfactory balance in hand. The judging of members' work for the year for the Society's silver and bronze medals was the next business. Some good work was shown, each member competing exhibiting a series of six pictures mounted and framed. The silver medal was awarded to T. G. Hibbert, and the bronze medal to Jonathan Taylor.

Bristol and West of England Amateur Photographic Association.

The ordinary monthly meeting was held on Wednesday, September 21st, at the Queen's Hotel, the president, T. Davey, in the chair. W. C. Hemmons was duly elected a member.

The weather having been unfavourable for the September outdoor meeting, Mr. Brightman's proposal that the postponed excursion should take place on Monday, September 26th, and

Wells be the place selected, omitting Glastonbury as first proposed, the shorter days precluding the possibility of working both places in the one day, was agreed to.

The Chairman then read a letter received from the hon. secretary, asking the Society to accept his resignation, as, in consequence of business and private engagements, he would be unable to devote sufficient time to the affairs of the Association. The Chairman said he regretted that Mr. Daniel had decided to resign the post of hon. secretary, which for so many years he had so efficiently filled; no one had done so much for the Association as Mr. Daniel; in fact, for some time he had been the life and soul of it.

It was resolved that a vote of thanks be given to Mr. Daniel for his services, and that a letter should be sent him expressing the regret which the members felt at his resignation, remarking that Mr. Daniel had been hon. secretary for eleven years, and had worked hard to make the Association a success.

Mr. Phillips proposed Mr. E. Brightman as Hon. Secretary. Mr. Brightman was well known in photographic circles, and from his long experience was looked upon as an authority; moreover, from his long connection with the Association he was well fitted for the post if he would undertake the duties. This proposition was seconded by Mr. Tribe, and carried unanimously. It was also decided that Mr. Brightman should still continue to act as Treasurer to the Association.

Mr. Brightman said that as one of the oldest members he felt great interest in the Association, and that no effort should be wanting on his part to contribute to its continued success.

After comparing notes as to the results of the out-door meeting at Tintern, the meeting terminated.

North Staffordshire Amateur Photographic Association.

The inaugural meeting of the winter session was held on October 5th, under the presidency of Mr. C. Alfieri.

A discussion took place upon the superior attractions of large pictures over those of small dimensions, the Vice-President giving preference to the former, while the President maintained that pictures of moderate dimensions, being more readily taken in by the eye in their entirety, were, *cæteris paribus*, more gratifying to the observer.

Referring to a well-known brand of dry plates, Mr. Leek said he had always failed to get sufficient density with them, notwithstanding the liberal use of pyro.

Mr. Drummond stated that he had had a rather singular experience while developing an interior of a church taken on one of these plates, namely, that a text round the altar screen had appeared quite plainly on the negative in the early stages of development, but had disappeared altogether when the plate had been fully developed.

The President having feelingly called the attention of the meeting to the fact that Mr. T. H. Hall, one of the earliest members of the Association had been removed by death from their midst, it was proposed that "The President, Vice-President, and Council of the North Staffordshire Amateur Photographic Association desire to convey to Mrs. Hall the assurance of their deep sympathy with her and her family in their recent bereavement, and to place on record their sense of the abilities and estimable qualities of the late Mr. T. H. Hall."

Messrs. Beech and Wright were elected members of the Association.

Society of Amateur Photographers of New York.

After a cessation of work for a period of three months, the society held its first fall technical meeting on Tuesday evening, September 20th. President Walker, in opening the meeting, remarked that he, as many others, had been out of the city most of the summer, but now the fall work of the society would commence in earnest, and he urged every one present to take some active part. Referring to the excursion of September 3rd, he said all who went had an excellent time, in addition to a fine light for photographing. He had received a letter from Dr. Hoagland, of Brooklyn, a member of the society, who went out on a special hunting and fishing excursion with twelve other gentlemen to a remote part of Idaho; he (Dr. Hoagland) was to do photographing for the party, while others were to chronicle its history. The excursion cost $1,000 for each member, and is to last forty days. The party is expected to return early in October, having left August 25th.

The President thought if the doctor did not meet with any mishaps, very probably the Society would get the benefit of the trip in having copies from negatives of very rich and beautiful scenery.

After some discussion it was voted that the regular technical meetings of the Society should be held on the second Tuesday, and the special meeting, or lantern-slide exhibitions, should be on the fourth Wednesday of each month. Not more than one lantern exhibition should be held each month.

The President read a list of a number of new members who had been admitted to the society since the first of June, and added that Mr Charles F. Smillie, who resigned from the society in 1835, had been recently installed as an active member, and congratulated the society upon his accession to its membership, since he stood high in his art, and was regarded by many as at its head. He further stated that the bye-laws had been amended, raising the initiation fee of associate members from $5 to $15. On being asked what the difference was now between an active and associate member, he replied there was none.

The Secretary then read a communication from Mr. F. C. Beach, presenting to the society, on behalf of C. D. Irwin, a corresponding member residing in Chicago, Ill, seventy-one lantern slides made from Mr. Irwin's negatives illustrative of scenery and life in Honolulu, Japan, China, Ceylon, Java, Egypt, and India.

A hearty vote of thanks was immediately passed, and the president remarked that he would write a special letter of thanks to Mr. Irwin.

A communication was also read from a society in Scotland, offering to make a special exchange of lantern slides with this society. Mr. R. H. Lawrence, in a letter to the president, stated that the committee on lantern slides expected to be in position to make the desired exchange. With these valuable additions of slides the coming exhibitions of the society will no doubt prove to be very attractive.

The committee of arrangements on the first annual exhibition held in this city last March, presented its final report. The following extract from the report will, doubtless, be of interest :—

The committee, after thanking the members for their substantial financial support, says: "The high class of work exhibited, its artistic character, its variety, and its fine technical quality, combined to make the exhibition one of great value, both as regards its educating influences and its effect in encouraging the production of better pictures. The following is a summary of receipts and expenses, which is probably greater than that of any other exhibition of a similar nature ever held in this country."

Receipts.

Season tickets	$392·50
Admissions	221·65
Advertisements	216 00
Sale of catalogues	61·55
Wall space	49·00
Sale of plates contributed by John Carbutt...	25 20
Sale of photographs	10·00
Sale of frames	2·60
Packing boxes	2·45
	$980·95

Expenses.

Printing	$363·10
Rent of gallery	300·00
Miscellaneous expenses...	123·47
Advertising	102 50
Cartage	26·50
Picture frames	26 07
Hanging and removing pictures	15·00
Society's pro rata share on diploma	13·34
Commissions paid	4·46
Total expenses	$974·44
Balance on hand	6·51
	$980·95

The report is signed by Charles W. Canfield, F. C. Beach, John T. Granger, Robert S. Redfield, George E. Cabot.

Mr. Roosevelt thought the committee deserved a vote of thanks for the success of the exhibition and the efficient manner in which it was managed.

The **President** called upon Mr. Beach to read his paper on "Developers for Instantaneous Exposures" (see page 637). At its conclusion, specimens, negatives and prints, were shown and passed around.

Robert Roosevelt then read a paper relative to a simple and easy way of mixing up solutions for developers. For the pyro solution he would establish two grains to each dram, so that, if we made up a developer of two ounces, we would put in one fluid dram of pyro to each ounce, or two drams for the two ounces. In other words, he would base all solutions on the principle of one dram to the ounce. After the reading of his paper, which was listened to with much interest, a brief discussion was held, some holding the opinion that the size of stop advocated by Mr. Beach for marine views was too large. Dr. Piffard had used a stop of $\frac{f}{32}$ with perfect success. A new plate-holder, sent by M. P. Warner, of Holyoke, Mass., was exhibited, having metal slides, roughened on one side for marking with a pencil. Also a new development tray in which the sensitive plate forms the bottom, and is clamped in between two jambs lined with rubber; it was invented by R. C. Atkinson, of Schenectady, N.Y., and exhibited by Mr. Granger, who spoke very fervently as to its usefulness. A handsome platinotype enlargement of D. Piffard's famous lightning photo was presented by him to the society.

After a few remarks by the President, the meeting adjourned.

The next meeting will occur on October 11th subject is announced. It should be noted that the diplomas for the joint exhibition last spring have just been distributed, and the attractive and original nature of the design is such as to make it a valuable memento of that notable event to those who were the successful winners.

North Surrey Photographic Society.

The first meeting of the present session was held at the "Greyhound" Hotel, Dulwich, on October 5th, W. H. **Walker** in the chair. There was a full attendance, and Mr. Baldwin and Dr. Williams were proposed as new members.

The **Secretary** submitted a letter from the Autotype Company offering to demonstrate the process of carbon printing before the Society for a fee of two guineas. The Secretary was instructed to write to the Autotype Company declining their offer, and it was announced that other arrangements had been made for a demonstration of carbon printing.

In spite of the fact that there was no formal communication to the Society, there was a very interesting and instructive discussion on the use and advantages of the Eastman stripping films, which had been very extensively used by the members during the recess.

The next meeting will be held on October 19th.

Talk in the Studio.

Nelson, Dale, and Co.—This firm of gelatine manufacturers has now been registered as a Limited Liability Company, under the style of George Nelson, Dale, and Co., Limited.

Medal to G. West and Son.—The above mentioned firm inform us that a gold medal has been awarded to them by the Jury of the Havre International Exhibition.

Influence of Light and Temperature on Chlorination.—H. Gautier (*Compt. rend.*, 104, 1714—1716).—Schramn has recently shown that the substitution of chlorine in the side-chains of benzene hydrocarbons can be effected even at 0°, provided the reaction takes place in sunlight. The author has made experiments in order to ascertain how far the laws of chlorination hold good for compounds other than hydrocarbons. When a current of chlorine is passed into acetophenone at the ordinary temperature, substitution takes place rapidly with development of heat. The product is a dichloro-derivative with the chlorine exclusively in the methyl-group. If a slow current of the gas is passed into cooled acetophenone in diffused daylight, substitution still takes place almost exclusively in the side-chain, the yield of a derivative with chlorine in the nucleus amounting only to about one per cent. The result is the same in complete darkness, the temperature of the liquid exerting no influence. Since the development of heat is mainly due to the formation of the monochlorine-derivative, the latter was treated with chlorine both in daylight and in the dark. The result was still the same. It is evident that in this case light has no influence on the nature of the substitution. It does, however, accelerate the change, which requires four times as long in the dark as in diffused daylight. It would seem as if the presence of an electronegative group tends to prevent the introduction of an element of the same nature. —*Journal of the Chemical Society.*

Photographic Club.—At the meeting on October 19, the subject for discussion will be "After-Treatment of Negatives."

To Correspondents.

⁂ We cannot undertake to return rejected communications.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

M. D.—Your experiment shows clearly that the defining power of your objective is very good. The lines are quite as sharp as one can expect.

Edmund E. Fearn.—Thank you. It is duly to hand.

F. Pifer.—On page 391 of our volume for 1881. The number is dated August 19.

C. P. Gibson.—Try Mrs. Evans' photograph shop in Duncannon Street, Charing Cross, London.

Dr. Richardson.—The letter has been forwarded.

James E. Ward.—1. A small book on the subject was either published by or sold at the Photographic Stores, Charterhouse Square. 2. Perhaps from Marion, of 22, Soho Square.

C. H. L.—We will write about the first matter referred to, after having done our best to trace the article. 1. Perhaps Marion can obtain it, but we cannot give you the address of either of the inventors. 2. You probably refer to a letter on page 284 of our issue for May 6th, and the article to which the letter refers appeared in the issue for April 15th. 3. The residue remaining undissolved consists principally of silica and other impurities which it is desirable to get rid of. 4. We will bear it in mind. 5. It discolours if an excess of alkali is present. 6. We will forward your letter on to W. K. Burton, but you will naturally have to wait a long time for a reply.

W. L. E.—Much depends on the plates, but with soft films the former has proved in our hands about four times as active as the latter. Others, however, have found a ratio almost inverse to this to hold good. The one with one-fourth of a grain to the ounce proved best, but it is advisable to soak the plates in water before commencing; and, moreover, the development takes place very slowly.

A. P. Higgins.—We quite agree with you, but it is not a matter that comes within our department. Your letter has been handed over to the publishers.

Lex.—If the doublet is of the rectilinear or symmetrical type, the removal of the back lens will make the rapidity about one-fourth of what it was formerly: that is to say if the stop remain the same, and the only other disadvantage is that to which you refer.

P. B. K.—We have seen it, and are not quite satisfied as to whether it is equal to the requirements of the case, as wood is not a very suitable material. We will write to you.

H. Schleussner.—In such cases we have used the instrument with the back towards the negative, although we have known the other course to be recommended.

M. N. S.—The former, provided that the development is made slow by the presence of a restrainer, and not by virtue of dilution, or as a result of hardness of the film.

The Photographic News.

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THE PHOTOGRAPHIC NEWS

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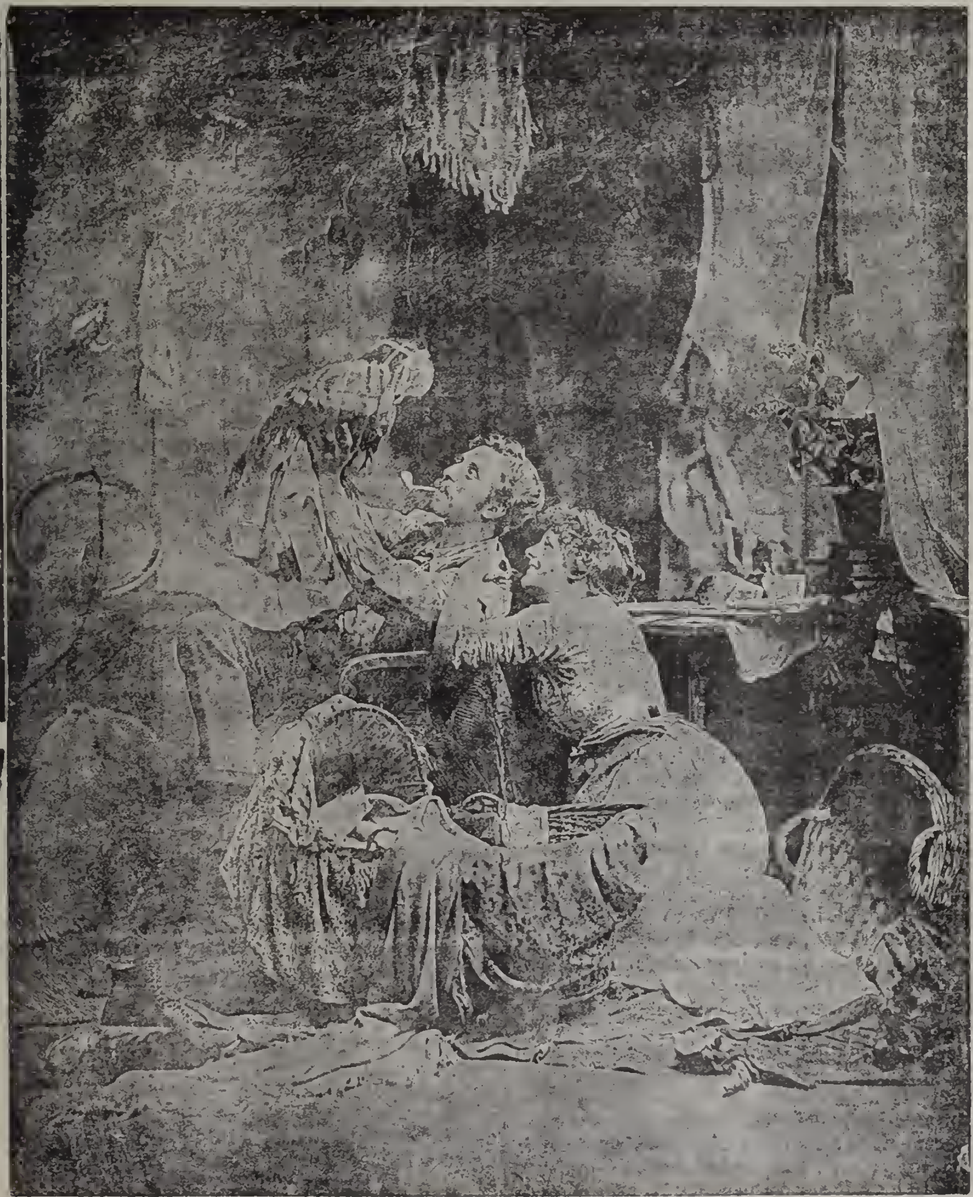
EXHIBITION OF THE PHOTGRAPHIC SOCIETY.

Third Notice.

Last week we made reference to the "studies" contributed to the Exhibition by Lydell Sawyer, and we spoke of them as possessing great merit, although they are by no means faultless. Indeed, when the photographer becomes ambitious, and attempts to represent anything like a scene telling a story, his difficulties begin. We regard No. 41 ("Home, Sweet Home") as the most successful sheet contributed by Mr. Sawyer, successful insomuch



Home, Sweet Home. By Lydell Sawyer.

as it contributes to the satisfaction of an almost univeral sentiment. Indeed, the remarks of those visiting the Gallery-especially the woman-folk—might lead one to regard it as the most popular exhibit in the room.

Of course it is easy to say that the result would have been far more satisfactory if a real baby had been used as a model; but, in the first place, the guardians of real babies have a natural objection to lending them to photographers for experimental purposes; and, moreover, the work would have been so much more difficult had the real baby been used, that perhaps the picture would not have been produced at all; or maybe it would have suffered more than it does by the use of the dummy baby. Although we assume the baby to be a dummy, we may say that if real, it is made to look remarkably like a dummy.

"Under the Olives at Mentone" (No. 45), by G. W. Tyser, is very pleasing as a composition, although too white in parts; and the latter remark also applies to No. 46, "The Earthquake at Mentone," by the same photographer. His remaining exhibits also show scenes in the same locality.

The panorama of the Royal Naval Review at Spithead (No. 48), by W. P. Marsh, is naturally out of drawing in a sense, but will interest many as a memorial of the event; while of the four exhibits sent by J. M. Nisbett, that which seems to us the most interesting is the first in the series "Models from Model Dwellings" (No. 50).

T. A. Green, of Grassmere, Westmoreland, has no less than eight frames, good work being contained in every one. We are especially attracted by his "View on the River Derwent" (No. 55).

HUNTING AFTER PORTRAITS.*

The Experiences of a Journalist.

When the editor of a paper says to you, "I want a light sketchy article of the ——,"—naming, say, a well-known business centre—"illustrated with the portraits of the best-known characters, showing, if possible, their peculiarities," it is perfectly obvious you cannot ask these "characters" for their photographs. Indeed, I am inclined to think for a "character" sketch, a photograph, so far from being a help, is rather a hindrance. Mr. Harry Furniss, I find from an article of his in the *Magazine of Art*, is of the same opinion. It would, of course, be a different thing if an instantaneous photograph could be taken at the same time you are noting the subject's peculiarities, but to mix up an orthodox, conventional, and generally expressionless studio portrait with an "impressionist" sketch, almost invariably results in confusion, and a consequent loss of spirit. For this reason the artist would prefer to be unfettered by the photograph, always presuming that he has sufficient time to study the features and characteristic pose of the man he wants to sketch.

One of the most successful, as it turned out, of the series of sketches made for a certain paper with which I was connected, was of this nature. The scene was an important commercial centre; the faces of the men whose portraits were desired could be looked at more than once, and doubtful lines corrected, and occasionally the note-book could be used without attracting attention. Accordingly I started with Mr. Easel—for the sake of convenience I will so designate my friend the artist—on the task, my share being to extract from a friendly *habitué*, who had undertaken to pilot us through the building, all the peculiarities he knew concerning the notabilities; and Easel's to fix on his memory the faces of the said notabilities for reproduction at leisure.

The commencement of an undertaking of this nature is generally mixed up with a little anxiety. Your guide, to whom you have to look for every particle of information, invariably starts with—

"Well, now, what is it you want to know?"

This is a question about as difficult to answer as Columbus would have found it, supposing the query had been put to him on landing on the shores of the New World. You are in a positive *terra incognita*. You can't make your "sketchy article" without material, and whether this material will be forthcoming, you feel is extremely problematical. There is such a difference in guides. Some are so wooden and prosaic you can get nothing out of them, though you know they must be possessed of a quantity of information which would be very useful. It is not that they are unwilling to tell, but they do not quite grasp your object, and the little bye-paths of a man's character, which are what you want, they do not think worthy to dwell upon. They are great upon the number of years a man has been in business, and will tell you whether he has made a fortune by a lucky *coup*; but here they stop. Luckily, in this instance, I happened to get hold of a gentleman of great shrewdness and quickness of apprehension, and as we strolled about he pointed out the men who were worth noting.

"Look at this old gentleman with the tanned face and white beard," he whispers. "One of the biggest representatives in his line, of the country trade. We have a market three times a week, and he has never missed a market for forty years. Rides to hounds, though he must be considerably over sixty."

"We'll have him," I say to Easel, and I mentally note a white hat, an upright collar, and a blue striped scarf, in case Easel, in concentrating his attention upon the face, chances to overlook these little points.

Here happens a little annoyance peculiar to surreptitious sketching. The country gentleman, though I am certain he hasn't the least idea of what is going on, persistently turns his head in the direction least desired. Whether mesmerism has anything to do with it I know not, but it is a fact that, directly an artist looks at anybody whom he desires to sketch, in nine cases out of ten the person becomes restive and fidgetty, and has an apparently irresistible desire to turn his head away. In this case it is not of so much consequence, as we shall have another opportunity of seeing the country gentleman; so we saunter on.

Our guide points out more notabilities in rapid succession. "That man," he says, "is the biggest man in the London trade," and he gives some particulars which it is not necessary to introduce here. "The gentleman with the beard is our chairman. Here is our secretary."

"Which is the secretary?" inquires Easel, faintly. "I am getting rather mixed up."

"That's the secretary with the glasses. The clean shaven man."

Before Easel has time to accurately fix the face of the secretary, the latter aggravatingly moves off, and, worse, disappears entirely.

The next man, happily, has a strongly marked peculiarity. He wears a hat of an unmistakable character. This gentleman's hats, I am told, are made for him, and he has worn the same shape—a silk hat with a straight brim—for a number of years. He has also his whiskers and moustache trimmed in the style in which John Leech used to draw the dandy of his day. With these pronounced points Easel can scarcely go wrong, and the result is one of the best of the series.

Anything out of the common is sure to be recognised, and the next "character" we deal with has, happily for Easel, an unconventional appearance. This gentleman has a long flowing beard, is pensive almost to melancholy, wears glasses and a pot hat. That absorbed expression is not difficult to catch, because of the strongly defined lines on each side of the nose. Besides, he stands poring over an account book at his desk for at least five minutes, and there is ample time to get his features correctly.

In due time we are introduced to other oddities. Among them is an old gentleman, and his clerk, who we are informed are never seen apart. The old gentleman has hair of snowy whiteness allowed to grow long, he wears a suit of solemn black, and has a mourning band reaching to within half an inch of the crown of his hat. The clerk is a chubby indivividual who looks thirty when seen from the front, and sixteen when viewed from behind. Easel determines to sketch them from the rear, as being the attitude most easily recognisable. We wind up the series with a sketch of an official who is at least six feet three in height, of military bearing, and has a highly cultivated moustache. No difficulty here, provided he has sufficient height and the proper moustache given him.

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* Continued from page 627.

Our experience in this series goes to prove what I have already advanced, that faces without a distinctive peculiarity are the most difficult to render satisfactorily. Taking the examples in the order in which they come in regard to likeness, they may be placed thus.—The broad-brimmed hat gentleman, the inseparable couple, the melancholy man, the official, the country gentleman, the town gentleman, the chairman, the secretary. The last-named, being clean shaven, was necessarily an awkward subject. The absence of a beard reveals all the lines about the corners of the mouth and chin, and if those are not put in with something like accuracy, the likeness is destroyed. Besides, in the case of a memory portrait, there the distinctives lines have to be noted, the beard reduces the number so materially that the task is made very much easier. It is, however, a gratifying thing to be able to say, that in this series all the portraits were easily recognised, which it need not be pointed out was the object aimed at. Nor, so far as I was able to ascertain, did the gentleman whose features were thus stolen, object. Indeed, they felt rather flattered with one exception—the gentleman who was drawn with his clerk. Whether he would have preferred being taken alone, or whether he disapproved of the back instead of the front of his head being shown, I cannot say.

(*To be continued.*)

BIRMINGHAM PHOTOGRAPHIC SOCIETY'S EXHIBITION.

The Annual Autumn Exhibition was held in the Technical School, Bridge Street, on the 13th inst., when there was a crowded attendance.

The number of pictures shown was over 400, including 160 for competition, which were sent in by 28 members. These had been previously judged, and the prizes awarded, by three professional gentlemen who kindly undertook the critical selection—viz., J. Collier, Harrold Baker, and Walter Breedon.

The following is an abstract of information sent by the secretary :—

Home Portraiture.—E. Underwood, for his picture of "A Girl Reading at a Table," evidently awarded on account of the graceful pose of the figure, there being other equally good pictures from a photographic student's point of view, but lacking the pleasing position of the prize picture. Honourable mention was also accorded to Thos Taylor, for "No Partings Yonder"; W. J. Harrison, for "Surrounded at Seaside"; Dr. Huxley, for "Children and Toy Carts."

For the Best Instantaneous Pictures.—W. J. Harrison, for "Leapfrog," in which the sharpness of the principal objects is remarkable, considering the short period of exposure. "A Waterfall in Sweden" is commended, but, whereas the photographer may take his time over the production of a perfect picture of a waterfall, a game like leapfrog gives fewer opportunities, and demands a promptness of decision for the right moment of exposure. "A Steamer at Sea" (E. H. Jaques), "Fossegarden Waterfall," Norway (E. H. Jaques), and "Going for a Sail" (W. J. Harrison), are also commended.

For the best Landscapes taken during 1887.—W. D. Welford ("In a Brambly Wilderness") showed a magnificent picture worthy of its success in every respect. Honourable mention is made of "Broome Village" (E. C. Middleton), "A Warwickshire Lane" (W. D. Welford), "Mapledurham Lock on the Thames" (J. H. Pickard), "At Dittishame" (A. Pumphrey), "Broome" (A. R. Longmore), "Chiddingstone, Kent" (J. C. Huxley).

For best Picture from Stripping Films.—"Warwick Castle" (F. Dutton), a very good bromide print from an Eastman film negative, exhibiting great choice in the selection of subjects, and careful manipulation. "Getting Boats over the Weir" (W. D. Welford) is commended.

For the best Contact Print by Development.—"Chiddingstone, Kent" (Dr. J. C. Huxley), for a fine sepia platinotype, which showed all the qualities of a high-class steel engraving. "Boulders and Ferns" (A. Constantine), "Chiddingstone," street view (J. C. Huxley), "Cottage at Charlwood" (R. G. Evered), were accorded honourable mention.

Enlargements.—This was not a successful class, no doubt owing to the non-preparation of enlargements, which the members generally do later on in the winter months. The judges suggested that in future the original negative should accompany the picture shown. "Family Pets" (Jas. P. Heaton) took the prize, and "Steamer off Llandudno"—an enlargement of an instantaneous negative by F. Hoskins—was highly commended.

Best Transparency in Opals.—Jas. P. Heaton again took the prize for "An Avenue on the Warwick Road." "Dovedale" (J. H. Pickard), "Cottages at Thorpe" (E. C. Middleton), "Boys Swinging on Gate" (W. D. Welford), "Fishing" (W. D. Welford), were highly commended.

A prize given by W. J. Harrison for the best photograph in the set of prize pictures, to be voted for by the members, was won by Dr. Huxley with his picture in Class F (Best Contact Print by Development) by twenty-three votes in excess of any of the others.

A large number of pictures were lent for exhibition, including some very fine carbon enlargements by Harrold Baker, and excellent and large platinotypes of local and other notabilities by Mr. Collier.

The exhibition was a great success in every way. Votes of thanks were given to the donors of the valuable prizes (Harrison, Huxley, Hulind, Iliffe, Jaques, Pickard, Place, Rooke, and Thos. Taylor), to the committee, and to Mr. Pickard for presenting the prizes.

During the evening, the hon. secretary read a letter from Mr. Collier offering a prize for competition amongst the members for the best photograph illustrating a subject, to be selected at the commencement of next season, such as "All's well that end's well," or the word "Done."

THROUGH ITALY WITH A CAMERA.

BY G. E. THOMPSON.*

Alas, for the people of Amalfi! we are no longer in Capri, among the descendants of the ancient Greeks; we no longer see the black flashing eyes, the symmetrical classic features, and the raven locks of Capri's daughters; those of Amalfi have a stunted, hard-worked, worn type of countenance. Their climate may have something to do with it. Situated on the southern face of the mountains, Amalfi is baking hot in summer, while Capri is open all round to the sea breezes; certainly many of the mountain girls are fine strong creatures, and you meet them descending with heavy loads of oranges or other goods, swinging along down the steep mountain paths, or long broken flights of steps, staff in hand, and singing as they go; they invariably stop and ask for soldi, but that is the regular custom of Amalfi folk. The first thing a baby learns to ask for is soldi, and as soon as they can run they learn to say the phrase, "Morto di fame," by which they intend you to believe that they are dying of starvation. Our hotel was in the midst of the life of the place; before sunrise we were woke by a Babel of tongues just under our windows; the rabble rose early from the night's rest, if indeed they took any, but instead of working, they would stand about in knots, talking and gesticulating vehemently. One morning we were awakened at an unusually early hour. The night was dark as pitch, but a red light gleamed from over the water: from the noise on the Piazza below there might have been a "corner" or a great drop in maccaroni; in an hour all was still, save for the gentle wash of the sea upon the deserted beach. A passing steamer had lain to outside, while her boat came ashore; hence the desperate excitement.

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* Continued from page 621.

Numberless and varied are the instantaneous pictures to be got on the quay, piazza, and shore. Early morning, before the sun shines full on the town, when the shadows are long, and the air is cool, is the time to get to work. Numerous boys are about, ready to put on the most piteous look, as they give you the usual information that they are starving; a little banter to the effect that you have not had your own breakfast, and are also dying of hunger, generally raises a smile, and they see that you know what frauds they are. After all, they are but young beggars, emulating their parents, the old beggars, in their endeavours to turn an honest penny.

A number of men are launching a large sloop by means of a windlass, and as the rope slowly pulls her down to the water, small boys are being kissed and hugged by the old salts aboard, and are then quickly dropped over board into the arms of men below; from the number who drop, there might be a cargo of boys aboard; the Italians love their fine brown little brats, and don't care to leave them until the last minute. As the ship nears the water the excitement grows; relays of men run continually round with rollers to place under the rapidly advancing keel; the rope is dropped, the men crowd on each side, pushing it with their hands, and, amid cheers and great noise from the owners, crew, and assembled towns folk, she glides with a bound, gracefully into the water, many of the men following up to their waists; her beautiful lateen sail is quickly set, and off she speeds on her voyage. Other sloops have arrived during the night, and there they lie in deep calm water close to the shore; a plank forms the bridge, and cargoes of filthy looking rags are being discharged for the paper mills. Of the on-lookers, who always greatly outnumber the workers, some are lying down near the water's edge, others stand in picturesque groups about the boats on shore, while the old fishermen sit inside mending their nets, and smoking the pipe of peace among their children. Further on, the long brown nets are stretched out on the sand and pebbles to dry.

Meanwhile the small stone piazza which occupies the space between the hotel and the water is being cleared and swept for its daily use in connexion with maccaroni making. The mysteries of maccaroni manufacture are too deep to be easily followed by the English mind, but we were privileged to witness some of the preliminaries connected with the treatment of the wheat from which it is made; and here we may remark, that maccaroni is nowhere better made than at Amalfi, and that when cooked by an Amalfian, it forms a dish, the tasty luxury of which a native of our benighted island has but little conception. And now for the manufacture.

A certain river flows down through Amalfi, past its sixteen mills, gathering much that is superfluous and ugly on its way, and, swelling as it proceeds, empties itself into the sea alongside the piazza. Here is a chance not to be lost. Kind nature has provided running water, and the people know how to use it. Women sit on the beach, and scour out their pans and copper vessels, rubbing them with the sand and stones, and swilling them with the water. The infant mind is taught to love its native river, and the imps sit by making mud pies. At its junction with the sea, men stand in boats, and wash their nets in the running water; but what has all this to do with maccaroni? This much: that, as we depict in our photo, great tubs are brought to the river where the women are scouring; these tubs are filled with river water, and bags of wheat are emptied into them!! Stage No. 1. The wheat is washed!! (Slow music.)

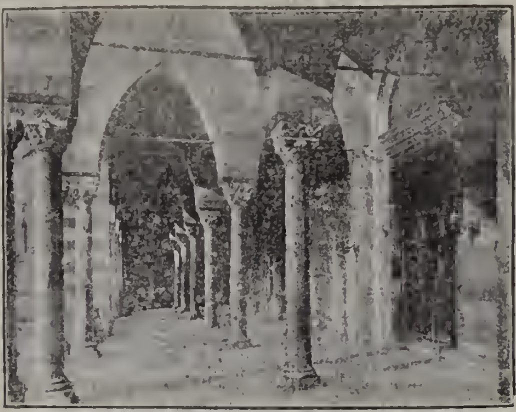
Return the flavoured wheat to the sack's mouth, and carry it to the piazza; then empty it out on the flat stone surface, while men and women, barefooted, walk up and down among it, raking it about till dry, a process soon accomplished under the rays of the Amalfi sun. The wheat is then passed through sieves and piled into heaps. Our insular ignorance here prevents us following out the manufacture, though we were certainly shown various stages; in one room we saw four men sitting on a long lever, which they worked up and down like a see-saw, moving it gradually backwards and forwards, while the beam pounded away at a mass of crushed wheat, resembling dough. Maccaroni is made in various thicknesses from vermicelli upwards; the most glutinous wheat is best, and it is always well to buy maccaroni that has a bend in it, proving that it was hung over sticks to dry, being of sufficient glutinous consistency.

Many subjects have been secured, and as the morning wears on, fresh ones quickly follow. A boat lying off the shore, waiting for a party from one of the hotels; another boat arrives from Positano, and we catch its passengers as they land along a narrow plank, or on the shoulders of the sailors; here a small fishing boat being launched by barelegged fishermen, there a company of girls preparing for work, and swathing their feet in endless wrappings of rags, tied on with tape, brigand fashion. Off they set, with their huge loads, but soon securing a cart, three of them make a co-operative business of it, piling on the load and setting off with it along the road towards Atrani, drawing the cart three abreast.

Towards midday the view of the town as seen from the convent is perhaps at its best. The sun rises opposite, over Salerno, and if, as I once did, you can catch the sun behind a cloud as it rises, and walk out of the monk's cell (your comfortable little bedroom) into the covered private balcony in front, you will obtain a result that will do honour to you and the dry plate. You can then, if so minded, retire again to your downy pillow, or from your exalted perch you can hear the distant buzz of the town, as the people gather to gossip, and watch the sun as it marks a line of gold along the water, and tips with light the white clusters of houses that mount the cliffs below you.

At midday the town is in broad sunlight, relieved with touches of shadow, and an effective picture may be had by climbing up the Calvary in the cavern at the far end of the convent. There you see Amalfi framed as a lunette by the mouth of the cave, and fringed with hanging stalactites. Then, should a stray monk be haunting the chapel or the cloisters at the time of your visit, ask him to sit by the vine-clad pillars gazing over the wondrous panorama of the bay of Salerno. There will be a touch of sadness about the picture, as you imagine he of the cowl ruminating over that not far distant time, when his Capuchin brethren enjoyed the quiet of this lovely retreat, before its halls were deserted and turned to the uses of a great hotel.

The market square of Amalfi lies very near to the quay, behind the Hotel Cappuccini, at the foot of the fine flight of steps leading up to the Cathedral; the space is rather confined, but a view of the whole cathedral tower and market may be obtained from the second or third storeys of one of the houses. The loggia at the top of the cathedral steps is a splendid subject, as the sun streams through its pointed arches and its many pillars. Fine old bronze doors, dating about 1066, open into the cool spacious cathedral, where are many relics from Pæstum, such as marble pillars, &c.



A staircase at the right leads down to the crypt, which dates from 1239, but which was renewed and coated with precious marbles in 1719. The crypt is used for services, and contains a fine bronze statue of St. Andrew, whose body rests below; the statue, which is life size, was presented by Philip the Third, and is the work of Michael Angelo Maccarino; it is, unfortunately, in such a dark place that it is impossible to obtain a good photo of it, though the chapel as a whole makes a good picture.

The streets and slums of Amalfi are like unto the burrows of rabbits in a warren; they may be cool, and they occupy but little space, and they may smell savoury or otherwise; but they are certainly dark, steep, and dirty. Half-open drains run down the sides or centres, doors of subterranean looking dwellings and stone stairs open into tunnels through the rock and under houses. So long as you persevere on an upward and onward course, you are bound to reach the top of the town. Boys swarm in the Amalfi warren, all staring, of course, and all wishful to act as guides. We soon reached the Campo Santo, a long corridor of arches, having an imposing appearance from below, and entered through a most neglected and woeful chapel, where cobwebs hung in graceful festoons, and where the dead in coffins are cemented up, one upon and across the other, in wild and ugly confusion. We came down by the ridge dividing Amalfi from Atrani past the Hotel de Luna, where are lovely old cloisters, with the sunniest and quietest of gardens, and central well.

Sunday appears to be the great foraging day for the country folk living on the hills, and dried fish would seem to be a much esteemed delicacy, judging by the number of people you meet toiling up the steep mountain paths and steps, carrying a sack, presumably full of eatables, with the inevitable fish hanging at the side. We had a grand climb among the hills on the west of Amalfi one Sunday morning; few people were about as we rambled upward. We met a man resembling a cross between an English gamekeeper and an Italian brigand; he carried a gun, and a magnificent bittern, which he had just shot. Higher up we entered a wood, which became so thick as we proceeded that we quite lost our way, and could scarcely pierce the undergrowth. We eventually came out on the edge of a circuitous precipice of great depth, and seeing some men far away on the other side we hallo'd and pointed. They understood our situation, and waved to us to continue round the precipice edge; this we did, finding a narrow path past caves, and beneath overhanging rocks, and enjoying the splendid views of Amalfi, the sea, and coast line, far below, and returning by an inland path through a village or two, and down some miles of steps. On Sunday evening, much singing is heard about the shore and the piazza. So far as we could judge, there were no voices equalling that of our friend Signor Vozzi. The music was much in a minor key, and every line or so ended in a prolonged melancholy wail, as of a dog in distress; possibly, if we heard more of this music, we might appreciate and learn to love it, but it would take time.

The coast road between Salerno and Amalfi, rightly considered to be one of the most beautiful in Europe, is being continued onward to the point of Campanella. Many portions are complete, but are utterly useless through their want of connection; headlands have been pierced by tunnels, and ravines have been crossed by viaducts, but the traveller cannot go further west than Amalfi at present, and as the authorities there are not particularly anxious that tourists should pass through by road to Positano, it may be long before it is completed, especially as it is said that the government is not subscribing towards it. When the road is finished, new beauties will be opened out, and the tourist will be able, by landing at the point of Campanella, to shorten the not always pleasant sail from Capri to Amalfi.

(*To be continued.*)

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.*

IX.—Mounting and Finishing.

When the slides are perfectly dry, they may be varnished or not, according to the ideas of the operator. If the plates have been properly treated, the films will be quite hard and glassy, and will scarcely require the application of varnish, either for the purpose of protecting the films from moisture, or rendering them more transparent—they should be transparent enough without.

If, however, varnish be thought desirable, care should be taken to procure from a respectable dealer a good, white, hard varnish, specially made for transparencies. Much of the varnish sold for negatives has a strong yellow tint, and this would not do for positives; they would be better without it. Yet some dealers will offer a common quality negative varnish when asked for a varnish for transparencies. The beginner, when purchasing varnish, should hold the bottle up to the light, and, if it have a yellow tinge, reject it at once.

To varnish a plate properly requires a good deal of dexterity and practice; but, briefly, the method is as follows. Warm the plate gently before a good fire, but don't make it *hot;* it requires to be *warm only* to avoid chilling the varnish, and to allow it to flow freely. Then hold the plate between the finger and thumb of the left hand, and pour a small quantity of varnish on the plate near one corner, and gently manipulate it, so that the varnish may be evenly dispersed all over the plate, leaving no bare patches, for these cannot be filled up afterwards. Then let the surplus varnish drain off into a spare bottle at the lowest corner. Before attempting to varnish either negative or positive for the first time, the beginner should practise, until perfect, on waste negatives.

As soon as the plate has drained sufficiently, hold it before the fire for a few minutes until it becomes quite hot, and the varnish is quite hard. If the plate be not of the right warmth before applying the varnish, the process will be a failure. An over-heated plate burns the varnish, and a cold one chills it, so that instead of having a brilliant glassy appearance, the slide looks cloudy, dusty, or granular.

Instead of varnish, a good enamel collodion may be applied, and will answer as well. The manner of applying it is just the same as that described above, but does not require as much care or experience, as heat is unnecessary. It is, however, requisite to avoid all patches or ridges caused by uneven flowing of the collodion. Some of the enamel collodion of the shops is too thick to flow freely, and should be thinned with ether and alcohol before use.

The glass plates for covering the slides ought to be the thinnest and clearest procurable. In many provincial towns the amateur, when enquiring for cover-glasses for lantern slides, will have common window-glass, often of great thickness, offered him. Such glass is quite unfit for the purpose. If the proper glass covers cannot be obtained, either at the glass cutter's or at one of the so-called "optician's," it is better to incur the slight trouble of ordering it from some well-known photographic stores in London, or one of our large cities. Some of the cover glass sold in provincial towns, neatly done up in packets, is fairly good, but frequently has a strong greenish tint, which makes it objectionable.

Papers for binding lantern slides, ready gummed, and cut to the proper size, may also be obtained at the photographic dealers. Don't purchase gummed paper *in sheets*, or waste time by making binding papers; that sold ready prepared is very cheap, and cannot be equalled by any home-made substitute.

The masks for lantern slides may also be bought in boxes, and the "Crown" lantern masks are perfection; but frequently a slide requires a mask of a different shape or size than the usual 3¼-inch circle or square, and these must be manufactured at home. The best and cheapest paper for this purpose is that known as "needle paper," so called because it is used for packing needles. It is of a bluish-black tint, with a smooth surface, and quite opaque. It may be obtained from some of the needle-makers of Redditch at a very low rate. The writer had some difficulty in getting the proper paper until Mr. J. T. Chapman, of Albert Square, Manchester, kindly gave him the address of one of the Redditch manufacturers.

Binding slides neatly and effectively is not a difficult matter, but requires a little practice, as well as natural neatness. When several slides are ready for binding, place them in a pile on the table, and as many binding strips as are needed. The cover glasses, *carefully cleaned*, should occupy another pile. Take up a slide, fit it with a suitable mask, and place the cover glass in position. Treat all the slides in this way until all are fitted with masks and covers. This is better than the practice of alternately fitting masks and binding.

Then take a binding strip, wet all of the gummed side except about two inches of one end, and lay it on the table. Now take up the topmost slide from the pile with its mask and cover, and, holding all in position between finger and thumb, place the edge of the slide down on the binding strip at one end, exactly in the middle of the strip. Next take hold of the dry end of the strip with the left hand, and, with the other hand, "walk" the slide over the strip, pressing the slide down tightly as each edge comes in contact with the binding strip, taking care to hold the paper firmly with the left hand to keep it steady, and to avoid wrinkles. As the slide is "walked" over the strip, it will take up the paper with it if the gum be good, and as each side of the slide assumes the vertical position, press the binding paper down tightly with finger and thumb, and be careful the paper at each corner is pressed down neatly. When the four sides of the slide have been passed over the strip, cut off the surplus end, and look over your work to see the paper does not warp or gape anywhere, and give the whole an extra pressing down. Wetting the strip properly needs a little experience: the gum must be damped quite through, but no more. If too dry, the paper refuses to stick; if too wet, it becomes loose as fast as it is pressed down, and the binding becomes a nasty, sticky, messy affair. The binding strip requires about as much wetting as a common postage stamp, when it will adhere so tightly to the glass, that it will be impossible to pull it off when dry without tearing.

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* Continued from page 620.

The labels for the slides may be gummed outside the finished slide, or written on the binding paper with Chinese white. If gummed labels be employed, it is better to put them *inside* the slide between the two glasses, attaching them to the mask. In this way, risk of losing the label is avoided, and it keeps clean in spite of frequent use. Labels attached outside frequently get lost, and, by becoming worn or dirty, require constant renewal. Writing the name with Chinese white, or some other white writing fluid, is perhaps the best plan, as it can easily be read in the gloom of the exhibition room, and is very permanent. This may be applied either inside on the mask, or outside on the binding paper. The slides manufactured by the Sciopticon Company have the names written with some kind of white fluid on the mask, and this plan is not only exceedingly neat and tasteful, but the most convenient and useful in practice.

Nothing has been said about *toning* the slides, as this is quite unnecessary with gelatine plates, the requisite tone being produced by development. If the amateur cannot, by varying exposure and developer, get a tone suitable to his taste, he is hardly likely to improve matters by using a toning bath. If, however, with bromide plates, he fail to obtain a warm brown, either with the pyro or iron developers, and object to an engraving-black, he may easily produce a warm brown by using the ordinary mercuric chloride intensifier in a weak form. Great care must be taken, with this plan, to wash the slide thoroughly in running water for several minutes after each operation, or it will fade or turn a sickly yellow. With proper washing, slides thus treated will be quite permanent.

(*To be continued.*)

THE CAMERA AND ITS IMPROVEMENTS.

BY G. G. MITCHELL.*

A CAMERA with a multiplicity of swing and other movements is probably a very ingenious invention, but it may be actually of less value to its possessor than one with a few useful movements. Every good camera is now made with a swing back, though few really make use of it, which is perhaps fortunate in one respect, for, as a writer has recently argued, it should almost never be brought into play except in a lateral direction, wherein, indeed, lies its most legitimate use. The camera should be planted square and plumb upon its tripod, and the front raised, if need be, not tilted up, but slid up when required, and in the great majority of cases it is so required, though the fact is little appreciated; and it is a question whether or not landscape lenses should not always be placed slightly over the centre of the front as their normal position. A bellows should rack out sufficiently for a long focus lens, and collapse in such a manner as to suit one of short focus, without having any portion of the extension frame in front intruded into the field of view.

The screw form of adjustment is good, but slow when no other means is afforded of obtaining extension. There should be a quick and easy way of drawing out the bellows to rough adjustment, and then a means be offered for fine focussing. A contrivance for this purpose, which can be operated by the right hand at the right side, I think more convenient than screw adjustment only at the middle of the back. A double rack and pinion has been found in the practice of some neither so lasting nor efficient as a strong single rack in the centre of baseboard. With two racks the pinion is occasionally liable to jump over the one or other of them, and get out of order. The less tail board any adjustment shows the better, because it is always more or less in the way when focussing, and, when large, requires the operator to assume a ridiculous position sideways, enough to give him crick in the neck.

The focussing screen is a sad necessity, so long as it must be of glass. If a flexible screen, or other substitute, could be found to fill its place successfully, the sooner such a brittle and obtrusive appendage, requiring so much care, is dispensed with, the better. The fear of damage to it is always present, and the consequences of a complete smash quite a disaster in some circumstances. When it is broken, without any means of replacing it being at hand, I would suggest a way out of the difficulty, which I do not recollect of observing any one recommend hitherto—Devote a sensitive plate for the purpose. It will be found an indifferent makeshift, but it will perform the work in most cases quite long enough till proper help is found. It gradually darkens into a slate hue, but not so rapidly as to prevent its repeated use before that comes on. With a little ingenuity it can be fixed in position in the empty screen frame.

A loose focussing screen is an intolerable nuisance. In practice it has commonly to be laid upon the ground near the operator, and unless its exact whereabouts is constantly borne in mind, it is liable to be trod upon. In such a case, the safest place for it is within the tripod feet, but it should not be loose, at any rate up to 12 by 10 sizes, or even larger. A recent improvement, by which the screen is simply moved outwards an inch or two, and partly aside, in a lateral position, is perhaps the best solution yet offered of what to do with the focussing glass. In this position it also offers least surface to the wind.

A camera that must be turned upon its side in order to expose a plate lengthways is behind the times. Either the revolving or reversing back is a great improvement. The change is made in a second, and the apparatus remains steady, which is rarely the case when turned on side.

A camera should not only be all of a piece, but it should admit of being speedily set up and taken down. If a deal of trouble be involved in making exposures a large percentage of the pleasure is destroyed. When we have got over the necessity for putting a number of parts together there still remain two operations which promise to see the present generation out, viz., erecting the tripod and screwing the camera on to it. After which the lens has generally to be screwed into its place with an equal amount of fumbling. Why must the camera continue to be screwed to the triangle, and in the most awkward way imaginable, with all the leverage thrown upon one screw? Why should it not be placed with one movement into some slot or other arrangement, and held there firmly, being as easily released when required; but why should there be a triangle at all? Should not each camera base contain its own means of securing the tripod legs? They are trouble enough in themselves, without adding to that by bothering with a separate triangle, one of the most ungainly things to pack and look after that can be imagined. It is somewhat unfortunate that the impedimenta of the photographer are rather difficult to make a compact burden of. The camera itself is compact enough, but the stand defies, apparently, all attempts to accommodate it otherwise than in a separate way, and the lens also usually requires special carrying attentions. Some cameras in the market now dispense with the tripod head, but much has to be done in the direction of increased portability.

The diaphragms, when not revolving, are another nuisance, especially when supplied all separate in their neat leather case. The case gets into one pocket, and the diaphragms wander into all the others, the particular one wanted being always the most difficult to find. The first thing a sensible man should do is to rivet all his loose diaphragms together by the finger tags, so that he can turn freely round the one he wants. In this way he will never lose one without losing the lot, and that he may do easily enough. I don't want to puff any particular appliance, but the Iris diaphragm seems so complete a remedy for all diaphragm troubles that something like it will probably supersede the present primitive style of things; besides, it offers no slit through which light may pass.

The double back is, perhaps, as well and conveniently made as it can, but I cannot help inclining to the opinion that a double dark slide should not be fed by opening in two halves—book form. However close-fitting it be at first, such a back is liable to warp and show a weak spot at the division, in spite of being well clasped. A back that is made solid in its outer framework, and fed from one side while the door is drawn, I maintain is the safest form, the simplest, the lightest, and should be the cheapest. No back should be made to slide into position on the camera, which it is most annoying to find is being moved by the effort to force the slide into place. It should simply be laid to, and simply but firmly clamped.

Any invention which would happily reduce the necessity for carrying so many slides, and at the same time supply an equally convenient means of exposure, would be welcome. The ordinary double back, notwithstanding the formidable rivalry of the new roll holder, is still the most suitable to use when moving objects are in question, because exposures can be made more rapidly in succession; but otherwise the holder is a distinct advance, and has a sure future before it. It merits are so obvious that comment is superfluous—a certain and visible means of knowing when the required length of paper is unwound, and an unmistakable indication of some sort on the paper itself between the exposures, should be considered essential. A very quick wind-off may never be desirable, because of the danger of ruffling the paper.

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* Continued from page 652.

One more remark. Every one should take at least two lenses with him when he goes afield; say one of six and one of ten inch focus, and an adaptor for the smaller size. He will find this very useful, and be enabled to bring home pictures which with one lens he could not possibly possess, because a composition which is beautiful for a six or seven inch may be impossible to a ten inch, and *vice versâ*. We have not yet got the lens that will do everything, any more than the camera which will do all it ought to do. The former is an impossibility, but the latter can be imagined, and probably will appear some day.

Notes.

Robert Hunt, who was one of the earliest of the photographic experimenters in England, died on Monday at the age of eighty.

Another experimenter who has just passed away is Gustav Kirchhoff: to him we are mainly indebted for our modern method of spectrum analysis.

In another place (p. 669) will be found a letter from the secretaries of the Camera Club, giving some particulars as to the conference to be held by that body in March next.

The conference of the Camera Club was last year a very enjoyable affair, and in every way a success; and if we may perhaps predict that the conference of March next will at any rate not be less successful; especially as the numerous societies now affiliated to the Camera Club are expected to co-operate.

The Amateur Photographic Society of Amsterdam has issued the first number of a large-octavo monthly, the "Fotografisch Maandblad." It contains an article on the hydroxylamine developer, one on paper negatives, also some notes and society notices.

Few persons have so frequent occasion to place their goods in the various receiving and store repositories as amateur photographers. Considering the frequency with which goods-storing premises are burned down, and that the proprietors of such places generally repudiate all responsibllity, a little care is necessary.

In the first place, no articles of any considerable value should be stored in such repositories unless the proprietor is willing himself to be responsible for taking out insurance on the goods, and moreover the person leaving the articles should have a clear understanding as to the part of the building into which they are to be put.

Hitherto there has been so great an inclination to accept as truth a bare circular from the temporary guardian of goods, to the effect that your goods have been completely destroyed by fire, as to almost offer a premium to those wishing to embark in fraudulent and incendiary schemes; and sham storehouses of goods are almost certain to arise unless the law is altered, or the public become more careful. When a person undertaking the care of goods pleads fire as a reason for their non-restoration, he should be compelled to prove on oath and by witnesses that the goods were in the portion of the building destroyed; or, in the case of total destruction of a building, that the goods were really in the building at the time of the fire. If proceedings for non-delivery of the goods are taken before a magistrate, legal evidence proving the destruction of the articles would be the only defence, and this would give an opportunity of cross-examination.

It is easy to see that few commercial frauds would be so remunerative as to receive articles for storage, to replace them by rubbish, and then, after burning down the place, to inform each person that his goods were totally destroyed; and this is a kind of fraud which is almost certain to arise, unless the public are more careful with such matters than they hitherto have been, or unless we get a law ordaining that a proper official enquiry be made as to the origin of every fire.

The frequency with which photographic goods have been lost to the owner through storage in warehouses makes the above remarks necessary. Photographic apparatus, as a rule, leaves no salvage, and as often as not leaves nothing behind to show if it has really been burned.

The number of visitors attending the Photographic Exhibition is highly satisfactory, and, on the whole, they seem pleased. A lantern illuminated with a small arc electric light was used with success at the evening gathering on Monday last, and it is said that on Monday next the Amateur Field Club will contribute some slides.

The progress which photo-gravure is making is evidently causing alarm in certain quarters on account of its supposed rivalry to engraving. We have already alluded to the correspondence which has been going on in the *Athenæum* for some little time, and last week the *Architect* ventilated its views on the subject in an article entitled "Photographic Illustration." The tone of the article is distinctly in favour of photography, not only in regard to its mechanical excellence, but also from the artistic point of view. The writer, for instance, holds that "the decline of engraving, however much we may lament it, must not be accepted as a sign of the growth of bad taste. On the contrary, we consider the preference for photographic prints as evidence of discrimination in choice. They are purchased because they are believed to have more of the original about them than is possible with a translation which may be made in the absence of the original, for everybody is of course aware that the majority of engravings from modern pictures are produced by the aid of water-colour copies."

Dealing with the various photographic processes in use for reproduction, the writer very correctly observes that the photographic copy, pure and simple, is not so obnoxious to the adherents of engraving as that which is a combination of photography and handwork, and therefore is "supposed to belong neither to science nor to art, and to be illegitimate." That this argument has no foundation is fully shown, and the writer further takes up a position which has hitherto been lost sight of, and that is the impersonal character of the photo-gravure, and the consequent lessening of value in the estimation of the public, who are impressed by the name of the engraver or etcher, and are inclined to look down upon photo-gravures because they bear no such impress. As the writer remarks, "We are sure they cannot be mechanical productions, but there our knowledge ends;" and he adds that it may be possible at a future time "to arrange the plates in a way that will be suggestive of particular operators, but at present everything has to be taken as due to the combination of light and chemicals, and the artist who works upon the plate is treated as a supernumerary." It is not necessary to follow the writer further. We may, however, say that the paper is ably written, and in so temperate a spirit that one can scarcely find fault with it.

A correspondent writes: "Some time ago you had some correspondence on the subject of the detention of proofs. That was bad enough, and you very properly expressed your opinion in plain terms. I have now to relate a case of detention of negatives, and should like your opinion upon it. Some time ago a lady left three negatives with a photographer and ordered a number of prints from them. It so happened that circumstances prevented her calling for the prints for five or six months. When she did call, she was told by the photographer that he knew nothing about the negatives, and that in all probability he had destroyed them. She naturally resented the destruction of her property, and on hinting that she should take steps to recover the value of the same, was coolly told that if she did, he (the photographer) would charge her for "warehouse room!" The loss of these negatives is rather a serious one to the owner, who was about to take a theatrical engagement, as her portrait was wanted for advertising purposes. It is true she might sit again, but why should she be put to this expense, especially as it is possible she might not get a portrait which pleased her so much as those which are supposed to be destroyed? The question is, can a photographer repudiate all responsibility in this manner, and has the owner of the negatives a remedy?"

Professor Trowbridge and C. C. Hutchins, of Harvard University, have suggested a new use for Galton's system by composite photographs. In a paper on "The Existence of Carbon in the Sun," they say it is possible in the future that the method may be applied to the solar spectrum, and by a judicious selection of photographs of elements a composite photograph may be obtained which will closely resemble portions of the solar spectrum, and will enable us to judge of the composition of the reversing layers of the sun. Professor Trowbridge's paper will be found in the *Philosophical Magazine* for this month.

The windows of the photographic print dealers give one a very good idea of the principal topics of the day. The importance of the Irish question is now reflected in this way. Parnell used at intervals to appear, but his characterless features have never attracted much attention. He is now shown in one of the principal London shops in company with Harrington, Healy, and T. P. O'Connor. What political significance may be attached to this little fact we do not know, but it certainly shows that the shopkeeper, who in the matter of trade has no politics, believes some interest is taken in the features of the prominent Home Rulers, or he would not exhibit them.

A PHOTOGRAPHER'S HOLIDAY IN NORTH WALES.

BY W. JEROME HARRISON, F.G.S.*

North Wales is entered, by rail, at two principal points. First, by Great Western, at Ruabon, where, while "waiting for the train," an hour can be pleasantly spent in roaming through the park of Sir Watkin W. Wynn, and thence due west past Corwen and Bala Lake, to Barmouth; and secondly at Chester, via either the London and North Western, or Great Western.

From Chester, the Chester and Holyhead Railway skirts the coast closely, the waves almost lapping over the line in many places, past Rhyl and Bangor, and over the Menai Straits to Holyhead.

Taking the northern route first, the photographer will do well to spend a day in Chester. He should be provided with a wide-angle rectilinear lens, as most of the "bits" to be photographed are in confined situations. Of these we may name the "Rows," streets of old-fashioned houses built one on top of the other, so that you walk on the top of one row of shops, looking at a second row, while there is yet a third row above you, supported on pillars. "God's Providence House" (1652), Bishop Lloyd's residence (1654), and the palace of the Stanley family, should be seen. The best view of the Cathedral is from the ancient walls which still encircle the town.

If the photographer is also a politician, it is probable that Hawarden Castle will have great interest for him. The station for Hawarden (pronounced Harden) is Broughton, five miles from Chester on the Chester and Mold line, whence it is a couple of miles to the castle. If the tourist is fortunate he may perchance secure an "instantaneous" of Mr. Gladstone tree-felling, as a Lancashire visitor did a few years back (the negative was sold to a London firm for a considerable sum).

Starting westward from Chester we soon cross the Dee, and run through Flint, where the ruins of a fine old castle are seen, surrounded and completely spoilt by mean houses and chemical factories.

Next comes Holywell, where the marvellous spring of St. Winifred's, discharging one hundred tons of the purest water per minute, attracts Catholic pilgrims from all parts of England. The well is a couple of miles from the station.

Continuing round the Point of Ayr, whose lighthouse, painted in broad bands of white and red, stands out prominently, the first eligible resting-place on the North Wales coast is reached in the shape of the very quiet little village of Prestatyn. The sands here are good, and the hills of mountain limestone rise sharply to the south. There are pleasant walks in all directions, especially one through Dyserth and past the Roman Catholic College of St. Beuno's to St. Asaph's, returning by rail. Near Dyserth there is a mystical ruined church—the *Chambre Wen*—overgrown with ivy, and so desolate and lonely that there surely ought to be ghosts about. Just fancy, some bright moonlight night, securing the photograph of a ghost! Or it might be done even better with the new powder whose ignition "enables photographs to be taken in the dark," as I lately read in a newspaper.

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* Continued from page 598.

Rhyl! Rhyl! Everybody knows Rhyl! And yet there is nothing at Rhyl but a fine stretch of sand, plenty of salt water, and a long pier. The country all round is very flat; but still Rhyl is a railway centre, and we can get away from it very easily, either to the east or west, or southwards along the branch line running through Denbigh to Corwen. But for those who like instantaneous photography, Rhyl Sands present splendid opportunities. The excursion trains weekly disgorge their thousands here; donkeys rush to and fro; the nigger minstrels are in all their glory; boats and yachts flit about; and a glorious sun shines down on all.

From Rhyl it is a short drive to the famous "marble church" at Bodelwyddan, whose interior contains some fine statuary; while the geologist will be interested in the Cefn Caves a little further off, in a ravine formed by the River Elwy.

From Rhyl we run westward through Abergele (now more generally known as Pensarn), and note the rise in the line where the terrible accident of 1868 occurred, when the mail train was literally burnt up by petroleum, and twenty-eight persons perished. A photograph of such a spot has an interest, apart from either its artistic or its technical excellence.

Passing now through a tunnel which bores the bold promontory of Penmaenrhos, Colwyn Bay is soon reached, a rapidly-growing place. The walks in the woods on the land side are very pleasing, and there is a curious little ruin on the shore called Capel Trillo—a sanctuary built over a well. These little beach "capels" are found all round the Welsh coast.

The next stopping-place is Llandudno Junction, whence a short branch line takes us northward to Llandudno—the queen of the coast—prettily situated on the neck of the peninsula of Great Orme's Head. The attractions of Llandudno are very similar to those of Rhyl, with the addition of the rock scenery of the Great and Little Orme.

Southward from the Junction another branch line runs through Bettws-y-coed to Festiniog; whence we can proceed to Portmadoc. Bettws (pronounce Bettus) is truly the photographer's paradise. Situated at the junction of the rivers Conway and Llugwy, each of these streams afford scores of views—the Fairy Glen, Pandy Mill, Pont-y-pair, the Swallow Falls, and the Miner's Bridge. I verily believe that if all the negatives of these places which have been taken were placed side by side they would reach from London to Liverpool! But what of that? Because a place is beautiful, and has been photographed a thousand times, is that any reason why I should not secure a picture of it made with my own hands? That will be far more to me than the most beautiful photograph or painting I could buy; will teach me more, and please me for time to come. Besides, just as there are not—and never were—two people exactly alike, so probably two precisely similar negatives were never taken; the varying seasons, light, &c., preclude it. May the beauties of Bettws long exist to give pleasure to generation after generation of photographers; and to teach them to know and love what is beautiful, natural, and true!

Patent Intelligence.

Applications for Letters Patent.

13,844. Thomas Rudolph Dallmeyer, 19, Bloomsbury Street, Middlesex, and Francis Beauchamp, High Cross, Tottenham, Middlesex, for "Improvements in what are known as instantaneous photographic shutters."—12th October, 1887.

13,886. William Dyke Wilkinson and Frederick Fowler, trading as W. Dyke Wilkinson and Co., 259, Stratford Road, Birmingham, for "An improved mount for photographs."—13th October, 1887.

13,999. James Sturrock, Dundee Advertiser Office, Dundee, Forfarshire, for "Photographic photometer."—15th October, 1887.

14,050. Adolph Tuck, Gustave Tuck, Maurice Myers, and James Lowe, 128, Colmore Row, Birmingham, for "Improvements in apparatus for attaching or suspending plaques and similar articles, which improvements are partly applicable to adjustable stands for photographs and the like."—17th October, 1887.

Official Abstracts of Accepted Complete Specification.

Urie and Urie, 16,327, 1886. "Developing, fixing, washing, and retouching." Automatic developing, toning, fixing, and washing apparatus for continuous sheets of photographs.

Sershall, 16,356, 1886. "Printing, colouring, and finishing." Combining several views in one photograph by means of masks produced by the printing press.

Brunner and Klary, 13,380, 1886. "Printing surfaces of celluloid, xylonite, &c., by pressing photo-relief thereon in heated condition.

Specifications Published.

1,637. George William Elliott, of No. 12, Clarkehouse Road, Sheffield, in the county of Yorkshire, Mining and Mechanical Engineer, for "Improvements in dark slides for cameras for photographic purposes."—Dated 2nd Feb., 1887.

The patentee says:—This invention has for its object the construction of dark slides for cameras for photographic purposes, so as greatly to reduce the cost of production, and also make them less bulky and more portable. Dark slides for cameras have hitherto been made of wood or cardboard; those made of cardboard being practically useless, and the use of wood rendering the others very costly. on account of the labour necessary for their construction, and bulky, on account of the thickness required to give the necessary strength for working. These defects are obviated by this invention, which consists of constructing them of metallic sheets, or sheets of vulcanised fibre, vulcanite, or other suitable material capable of being folded, creased, stamped, or pressed into the required shape. A piece of sheet tin or other suitable material of the required size is so stamped, or pressed, or folded on its edge as to form a groove for the sliding door or shutter, and at the same time be perfectly light tight, and of sufficient depth to allow of the sensitive plate being placed between the back of the slide and the sliding door. Two of these pieces are placed at the required distance apart, according to the size of the slide or plate to be used, and are joined together by the piece forming the back of the slide. The ends are made light tight by the insertion of suitable material such as cloth, bearing against the inside of the sliding door or shutter, or by being folded over in a similar manner to the sides. The whole slide, excepting the sliding door or shutter, may be made of one piece stamped or pressed into shape, or may be any combination of pieces to suit the convenience of manufacture.

The sliding door or shutter has its two outside edges folded so as to work in the folds formed in the body part, the whole forming a level or flush surface, and a perfectly light-tight joint. A portion of the back is indented so as to bear against the sensitive plate, and by means of the spring of the back plate hold the sensitive plate in its position. The folds forming the guides for the sliding door or shutter may be such that the slide may not require folding on its edges which work in these guides, but be kept plain.

15,187. Walter Philip O'Reilly, of 399, Edgware Road, in the county of Middlesex, Manufacturer, for "A new or improved combined photographic camera and photographic enlarging lantern and magic lantern."—Dated 22nd November, 1886.

A combined camera and optical lantern.

15,000. William Speirs Simpson, of Battersea Park Road, Surrey Engineer, "Coin receiver and deliverer for exhibition of photographic or stereoscpic views in fixed quantities."—Dated November 18th, 1886.

The Patentee says :—

Tho object of my invention is, to fit within a case—containing photographic or stereoscopic views, principally transparencies, which are slipped into an endless or travelling rack—ratchet wheels, a stop paul, and a releasing paul or lever, which releasing paul or lever is balanced to that of a coin, say a penny, the weight of which depresses said lever and releases its tooth. The coin is inserted into a slit formed in the casing itself, and the coin slides down a hopper, one face of the lower part of which is hinged or otherwise arranged so that when a fixed number of photographs has been brought in succession behind the eye glasses, a portion of the rack frame, or a stud thereon, acts upon the hinged side of the hopper, and pushes the coin into another slit for its passage into a till or receptacle. I prefer to fit the stop paul on one end of the axle which carries the endless chain of racks, the tooth being arranged to prevent a back motion being given to the chain, and to fit the tooth of a releasing lever on the opposite end of the spindle, but within the casing. That part of the hopper which retains the coin upon releasing lever may have a motion given to it by the stud, or other appliance of the chain rack, which stud or its equivalent is fixed on say the twelfth or the twenty-fifth, or any other number, or any of the intermediate rack frames to suit the number of views to be exhibited for the value of that coin. Rods can be fitted to be acted upon by the travelling chain of racks, so that when the last of the fixed number or series of pictures has been exhibited, a shutter can be moved to close the sight holes or eye glasses, the insertion of a fresh coin unlocking the balance lever and removing the shutter.

16,012. Edmund Edwards, of the firm of Edwards and Co., Patent Agents and Engineers, of 35, Southampton Buildings, Chancery Lane. in the County of Middlesex, for "Improvements in apparatus for printing photographic pictures."—A communication from abroad by Hans Brand, of Baireuth, Germany.—Dated 7th December, 1886.

The Patentee says :—

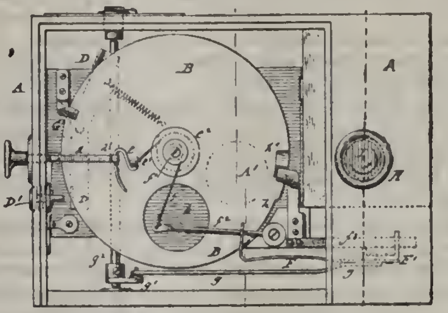
This invention relates to apparatus for the rapid printing of photographic pictures upon paper or other surfaces rendered sensitive to light by bromide of silver and gelatine or other means. The improved apparatus is not intended for the reproduction of pictures by any of the known mechanical printing processes, but for the rapid and perfect production of positive prints of any dimensions upon highly sensitive material, where it is of importance that the exposure should be accurately timed, and all extraneous rays of light excluded. The improved apparatus consists of a frame taking the place of one of the panes of an ordinary window, the remainder of which is darkened with some non-actinic material. Into this frame are fitted two hinged shutters, one opening outward and the other inward into the dark chamber. The latter turns upon hinges at the bottom, and is held by a catch or bar at the top when closed. It has a central opening also closed by a shutter hinged below, which carries the sensitive material upon which the picture is to be printed, and is covered with a non-actinic cloth. The shutter opening outward, as well as that last described, are held when closed by a double catch at the top of the outer frame, turning upon a pivot and held in its normal position by springs. At the lower side of the outer frame, which opens inward, as described, is fixed a bracket carrying a spring upon which the inner shutter carrying the sensitive surface falls when open. The inner side of this last shutter carries a flat plate or support resting upon springs between them, and covered with a sufficient number of thicknesses of soft elastic material such as velvet or plush, upon which the sensitised paper is laid and held in its position by a thread carried by side wires or fastenings. In the principal frame fitted into the window, as first described, is fitted a plate glass, across which are arranged two adjustable bars sliding at their ends in vertical grooves in which they can be fixed in any position by screws. These bars hold the photographic negative.

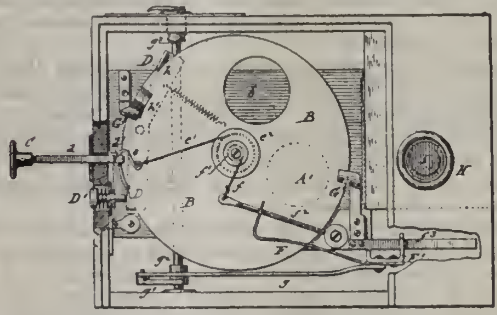
To use the apparatus, the operator closes the shutter, which opens outward by means of a wire or bar and handle passing through a light-tight opening, until the top of the shutter frame is held closed by the outer end of the top catch ; the negative is then fixed in its place against the plate glass by the two adjustable bars, and the sensitised paper is adjusted in its position upon the elastic bed prepared for it. The latter is then raised until closed, when it is held by the inner end of the top catch, the outer end of which at the same time releases the outer shutter, which falls outward. When the exposure has been sufficiently long, the outer shutter is closed by the handle, and in becoming locked by the top catch it releases the inner shutter and sensitised paper, which fall inward, when the print can be removed and a fresh sheet of sensitised material adjusted in position, and so on as often as desired.

Patents Granted in America.

369,818. William Schmidt, Brooklyn, N.Y., for "Photographic camera."—Filed Nov. 20, 1885. Serial No. 183,493. (No model.)

Claim.—1. The combination, in a photographic camera, of a otary shutter, having an opening coinciding with the main ube, a pulley on the hub of the shutter, a pivot-arm connected by a cord with said pulley, a spring applied at one end to the pivot-arm, and mechanism for increasing or decreasing the tension of said spring, substantially as set forth.





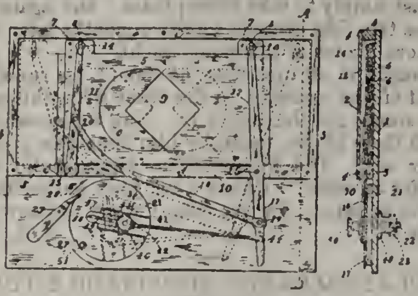
2. The combination, with a main tube, of a rotary shutter having an opening coinciding with the main tube, and a pulley on its hub, a pivot-arm connected by a cord with said pulley, a spring connected at one end to the pivot-arm, a slide-piece attached to the opposite end of the spring, and mechanism for setting the slide-piece and adjusting the spring on the pivot-arm, so as to move the shutter at a greater or smaller speed past the main tube, substantially as set forth..

3. The combination, with a main tube, of a rotary shutter having an opening coinciding with said tube a detent for retaining the shutter, a trigger for releasing said detent, a pivot-arm connected by a cord and pulley to the hub of the shutter, a spring connected to the pivot-arm, an adjustable slide-piece attached to the spring, and mechanism for setting the slide-piece so as to adjust the spring on said pivot-arm, substantially as set forth.

4. The combination, with a main tube and lens, of a rotary shutter, having an opening coinciding with said main tube, a detent engaging the shutter, a trigger for releasing said detent, a pivot-arm connected by a cord and pulley to the hub of the shutter, a spring connected to the pivot-arm, a slide-piece attached to the opposite end of the spring, a fixed rail for guiding said slide-piece, and mechanism for setting the slide-piece on said rail, substantially as set forth.

369,997. Alfred W. Simon, Akron, assignor to himself and Stephen B. Butts, Buffalo, N.Y., for "Combined photographic shutter and diaphragm."—Filed May 26, 1887. Serial No. 239,404. (No model.)

Claim.—1. The combination of two shutters having openings, substantially as specified, with two pivoted arms, one pivoted at its lower end and to the shutter-frame, and its upper end to one of the shutters, the other pivoted on or about the same horizontal line to the shutter frame, and its upper end to the othe shutter, a connecting-rod pivoted to one arm above its pivoted point on the shutter-frame, and to the opposite arm at a point below its pivoted point on the shutter, a connecting-rod pivoted to the lower part of said arm, and having its opposite end pivoted to a crank, a crank disc provided with notches, a pivoted pawl for engaging with said notches, and a spring for operating the whole, substantially as and for the purposes described.



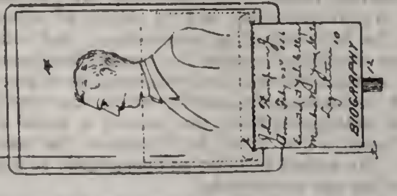
2. The combination of two apertured shutters, their operating arms pivoted to the case, a connecting-rod for connecting the two arms as above specified, a crank disc having a spring for operating it, and notches and a pawl for holding it against the force of the spring when engaged with either of said notches, a crank made adjustable to or from the centre of said disc, so that its throw may be made greater or less, and a connecting-rod for connecting said crank with the lower part, 17, of the pivoted arm, 12, whereby the size of the opening through the shutters may be adjusted, substantially as described.

3. The combination of a photographic camera shutter, the crank disc, a volute spring connected with the crank disc at one end, and the other end connected with a barrel, 24, having a thumb-nut, 23, the parts 23 and 24 being connected together and to the covering plate by a set-screw, a ratchet-wheel connecting the thumb-nut, and a pivoted pawl for engaging with the teeth in said wheel, whereby the tension or force of the spring may be adjusted, substantially as described.

4. A photographic camera shutter, a crank disc having a slotted plate rigidly connected thereto, and provided with a groove on its under side running its entire length, and a screw-bolt having a head adapted to slide in said groove, in combination with a slotted crank, a pin secured to the slotted plate and projecting through the crank slot, the slotted crank having a hole through which the screw bolt passes, and a thumb-nut for securing the whole at any point desired, whereby the length of the throw of the crank may be made greater or less, substantially as described.

370,186. George W. Fountain, Cameron, Mo., for "Biographical photograph card."—Filed March 12, 1887. Serial No. 230,639. (No model.)

Claim.—The combination, with a photograph card formed with a recess, 20, and a slot or opening, 2, of a blank, 10, having ears, 11, and a finger-tab, 12, substantially as described.



Correspondence.

THE EXHIBITION AT PALL MALL.

Sir,—Having been awarded a medal for the above, I suppose I ought not to complain if some of the reviews seem to have missed the chief characteristics of my exhibits, and have therefore criticised them depreciatorily. May I crave a little space to point out my chief aims in this work? These have been, first, the selection of rare and beautiful objects, not ordinary "commonplace" shilling slides; second, to see what success was possible in the acknowledged difficult and rarely worked field of dark ground illumination (*i.e.*, opaque objects by reflected light and objects lit by spot lens or paraboloid); third, the overcoming, as far as possible, that greatest of cruxes in photo-micrography, the focussing of all planes with equal sharpness, even in extra deep objects, such as, for instance, *Polycistina*—opaque—taken with one inch O.G.

It was my success in these latter points, artistic and natural effects in illumination and great depth of focus, that decided the very high praise accorded me at the Royal Microscopical Society (see their Journal, June, 1886, pp. 557-560). It was disappointing, therefore, to find the *Times* and other papers giving my exhibits but superficial criticism, the reason being, I suppose, that the objects being of a class to be quickly recognised, and no special knowledge of the difficulties overcome being available, it was simplest to dismiss them perfunctorily as "commonplace," and "not above the average of such productions," and to accord all the praise to a class of work which, however well done, is still unintelligible to the great majority.

I refer, of course, to Mr. Pringle's beautiful specimens of Bacteria and Bacilli. But I would ask how many of the visitors (including the critics) are able to guage the accuracy of these photographs, or their truthfulness in rendering the living originals? None but actual students and workers can at all appreciate (I don't mean enjoy) them at their real value. "Definite progress"—to quote your own words—means progress beyond other work of the same kind. Are these, then, better than Dr. Crookshank's as shown at the Royal Microscopical Society? Personally, I take no interest in Bacteria; they have no structure to pay for care in delineation; I do not believe they ever have had, or ever will have, the slightest value therapeutically; and I am glad to find that they are fast losing their interest and value pathologically. Even the redoubtable Pasteur is past his zenith. Rival experts and theorists are already decrying the value of the processes and supposed results. I may confess that Mr. Pringle's beautiful photos charmed me most as specimens of exquisite decorative designs; the character and display of the image, the very artistic printing and mounting, struck me very forcibly in this light.

The opinion you have before now expressed on my work contrasts rather curiously with the depreciatory remarks in your issue of the 7th inst. I quote from your Year-Book, 1887, p. 156-7. The occasion was when I showed some of the same work at the Royal Microscopical Society. "These photo-micrographs were of singular beauty and excellence, the principal feature being that though the objects were opaque, and the surface irregular yet all the irregularities were in focus."

I find that the limit to the successful showing of widely divergent planes in focus together is so soon reached with the present style of object glasses that I think it must be this effect that is alluded to by Dr. Klein when he says (as quoted in the *British Journal of Photography*, Aug. 19th, p. 516) that "no real advance has yet been made in producing photograms to take the place of accurate drawings of objects under high powers." It is only too evident to workers that the higher the power employed, the greater apparent divergence in planes; therefore, as there is no probability of optical laws being altered for our special needs, it must be only with a new style in object glasses that further success in this direction can be reached. Perhaps, as Dr. Klein says, "with the new apochromatic objectives and protection eyepieces by Zeiss, better results may be looked for."—Yours faithfully, Fred. H. Evans.

158, *Osbaldeston Road, Stamford Hill, N.*, Oct. 18th.

THE CONFERENCE OF THE CAMERA CLUB.

Dear Sir,—Would you be good enough to permit it to be announced in the News that the committee of the Camera Club has decided to organize a Spring Photographic Conference in 1888, similar to that held in 1887. An influential committee of members has been appointed to carry out the necessary arrangements.

The Conference will be held on Tuesday and Wednesday, 13th and 14th March, in the Hall of the Society of Arts, the use of which has again been kindly granted by the council. The president of the Club, Capt. W. de W. Abney, will preside, and the proceedings will commence each day at 2 p.m.

At the same time, there will be held in the Library of the Society of Arts an exhibition of apparatus and one of members' photographs, the latter at the Club rooms.

Lantern slides will be shown on the evening of the first day of the Conference, and at the conclusion of the second day the annual Club dinner will be held.

On the Monday evening previous to the Conference a smoking concert will be given at the Club house.

Further particulars will be announced later. We are, dear sir, yours faithfully,

George Davison, } *Hon.*
E. G. Spiers, } *Secs.*

Camera Club, 21, *Bedford Street, W.C.*

WHAT IS AN AMATEUR?

Dear Sir,—May I ask what is an amateur? The question may appear to be a singular one, but I am a little bit puzzled on the point. Amateur photography has become such a rage, that the question has been asked, What becomes of all the negatives? For instance, at the Clyde Regattas this year, wherever you looked, cameras of all sorts and sizes could be seen firing at the different yachts. Of course, the noted *Thistle* received a fearful number of shots. Amongst all these cameras, I was particularly attracted by one of huge proportions, and, being very much interested in photography, I felt curious as to who was the enterprising owner of this colossal camera. On making enquiries, I found it belonged to an amateur. I happened to get into conversation with him, and asked several questions about photography. He seemed wonderfully clever by all I heard, and I asked him, "What do you do with your negatives? It must be a very great expense to take such large pictures simply for pleasure." "Oh, nothing," he said, with a smile, "only print a copy or two and put the plate away." Well, I thought this strange; amateurs, as a rule, like something that is more portable, instead of a camera that requires four men to handle.

Not feeling satisfied, and having my suspicions raised by a few things I heard, I made further enquiries, and found he was seen at the Regattas on the Thames, then again on the Solent. At last I discovered, through a friend of mine, that some of these identical photos were exposed in a shop window for sale, which brings me to my question —What is an amateur? And again, I find this amateur, who lives in the south of England, made a special journey to Scotland so as to be the first to take the *Thistle* on her sail trials. The designer of the yacht, it appears, received a letter from him asking permission to do so, which was granted because he was an amateur, but would not let any professional, because he did not wish any views of the yacht published until it was unavoidable. Now this amateur obtained, I am told, some very good views of her in full sail. These photos have never appeared (as far as I know) in this country, but they have been seen in America. The important point is this: that these photos were taken before the American yacht was commenced to be built. A professional told me that if he could have obtained a photograph of the *Thistle* at the time this amateur did, he could have got £50 for it from America.

Then, again, this amateur made a special journey of 800 miles just simply to take these photos; and again he made the same trip (big camera, &c.) two months later to obtain some more photos of this noted yacht.

I thought it strange that he should be running from one end of the country to the other with this enormous camera simply for the love of it. Now the question arises, how did these photos taken by him appear in a shop window for sale? Did he give them away, or did he write, asking for an offer? I have it on good authority that he asked for an offer. In this case, I want to know, is he an amateur? A. J. West.

ARE PLATE-MAKERS RESPONSIBLE FOR BAD PLATES?

Sir,—I beg to submit for the consideration of my fellow professional workers the question whether the time has not arrived that some united action should be taken to test the liability of plate-makers for issuing inferior and defective plates.

This day I have had several plates frill completely off the glass, with the thermometer at freezing, and alum freely used. They were a fresh batch of Belgian make, which bears good repute, and my loss thereby is several pounds, to say nothing of the humiliation of having to return the money, and loss of prestige occasioned thereby. Most of us have had, unfortunately, a similar experience to mine; a whole day's work lost from some defects in the plates, whether English or foreign.

Cannot the makers be brought to book if it can clearly be traced home to them? I should be pleased to contribute ten pounds to any fund raised for the protection of photographers against the issue of inferior plates by makers, as now we are completely at their mercy.—Yours faithfully,

Fred. T. Palmer.

Clarence Studios, Kingston-on-Thames, &c.

Proceedings of Societies.

Photographic Society of Great Britain.

At the adjourned discussion of the new laws which took place on the 11th inst.,

Capt. Abney moved to amend title, and make verbal corrections, Rule X., paragraph 22, to read—"Election of council and officers," and to omit—"of officers," in the first line.

T. Samuels seconded, and this was agreed to.

H. Trueman Wood moved an amendment to so alter the construction of the remainder of this paragraph from "re-election," so that the council could be elected from a house list. Whether a division was taken on it or not, he thought it better to adopt the principle, which is practised by every learned society in London. It was customary for the council of those bodies to submit names of members most likely to prove suitable.

Capt. Abney seconded, and, in doing so, referred to the opinions he held regarding nominations, and which created differences of opinion between his former colleagues and himself.

W. M. Ashman thought it very undesirable to give council the power of nominating themselves, which was practically what might be anticipated from the issue of a house list. If the council issued a list at all, let it include the name of every member. He wished to move an amendment to the effect that "a house list was undesirable."

It was pointed out by Capt. Abney that this was tantamount to a direct negative.

J. Traill Taylor said the idea was tried once before, and the Society nearly burst up in consequence. If the council persisted in having a house list, there would be the same trouble again.

J. Werge well remembered the circumstance referred to by Mr. Taylor; he was opposed to a house list, and in favour of a free list from which a member could nominate whom he chose.

T. Bolas said if they considered Mr. Wood's amendment further, they would find it inapplicable to their Society, however well it answered in some of the learned societies. He thought it would be apt to cause a clique, and members outside it would probably nominate candidates of their own, and run those candidates in, instead of the council's nominees. If the council issued a list of names, he believed it would tend to break up the Society.

J. Spiller had been a worker under both sets of rules, and should certainly support the amendment. "Are we not chosen by the constituents?" he enquired. "Are we not thought fit to perform the work? If not, why are we here?" He was on the council when they took that gallery and doubled their rent. Mr. Thomas submitted the matter to the council, and they undertook the responsibility. If twenty-four members can undertake this important work for the Society, surely they can nominate suitable men to serve on the council.

W. Bedford thought there was no question about trusting the council, however elected; but he should not support a house list nomination. If they could get good working members in the management of the Society, so much the better for the Society. He did not think there was any chance of ineligible men being elected, but it was a great responsibility to get up a house list.

F. Cobb was a little surprised that those who drafted the rules, new and old, should try to force on a house list.

S. G. B. Wollaston thought the council had arranged among themselves to force this amendment, and had practically packed the meeting.

H. Trueman Wood objected to this construction being put upon his motion; he had not mentioned the subject to any other member, and asked Mr. Wollaston to withdraw. The objection raised that it would form a clique was less likely to occur with a house list than a scratch list. The issue of a list of all the members, as suggested by Mr. Ashman, he thought would be a better plan.

Capt. Abney was favourable to nominating all the members, and, if Mr. Ashman proposed it as an amendment, he would second.

W. M. Ashman preferred the rule as proposed by council.

S. G. B. Wollaston assured Mr. Wood that he had no intention to be personal; he was always careful to avoid personalities, but, from the support given to the proposition, it appeared to him there had been collusion.

T. Bolas remarked that when once they started on a house list there would be no end of adjournments. It was a mistake to imply that the members and council were not in perfect accord; but, if the house list was carried, there would be a rebellious organisation formed which might lead to disruption, or do the Society a great deal of harm.

The amendment was then put:—Not in favour, 27; for, 9.—Lost.

J. Werge wished to amend last clause, paragraph 22—"The secretary shall inform by letter each nominee of the fact of his nomination, and 'no reply' to the letter will be considered as acceptance of the nomination." There were many reasons why reply could not be given in all cases, and he objected to nominations being made without consent; the alteration he suggested would stop this in future. He moved that no members' names be proposed before consent obtained by nominator, who shall send the written consent of nominee to Secretary prior to name appearing on list. S. G. B. Wollaston seconded.

T. Sebastian Davis explained that difficulties might still arise, and gave reasons why "no reply," being equivalent to acceptance, was decided upon.

W. Bedford supported the amendment, but failed to see how it would meet the case if all the members were nominated.

The amendment was carried.

A. Mackie proposed to add after address, "containing a list of retiring members, and their attendances at council meetings."

H. Trueman Wood seconded.

W. S. Bird thought it was a great mistake to make anything penal to members who did their best. It amounted to ingratitude to services rendered; altogether it was invidious.

T. S. Davis thought members should have the opportunity of knowing the attendances of members; in bygone times non-attendants had been re-elected, while regular attendants had not.

Capt. Abney contended that such a resolution cast a stigma on those who had served the Society well. Illness, or many other reasons, might cause attendances to be low. He objected to it as being unfair, and prejudicial to the Society's interests.

J. Spiller related his experiences of losing count while actively engaged as Secretary and Treasurer.

W. Bedford said the principle had been adopted, and worked well. He failed to see how such a proceeding would cast a stigma, as suggested by Capt. Abney.

A. Mackie said that last year one or two of the council had not attended a single meeting, and he thought anyone who undertook the duty, and did not perform it, was not deserving of the gratitude of the Society.

T. Bolas said it was difficult to understand where the slur came in. Members ought to know how far the council had fulfilled their duty. As a rule, a member's attendances indicated his value as a councillor. Suppose anyone has been prevented from attending, he might make a short statement setting forth the reason.

The amendment was then carried—18 for, and 10 against.

T. Samuels then requested that the rules be read as settled by amendment. This being acceded to,

W. M. Ashman submitted his amendment to increase the number of nominations from 6 to 20.

Capt. Abney seconded. Carried.

Capt. Abney proposed, and T. S. Davis seconded, that two be altered to four Vice-Presidents. Same rule—carried.

G. L. Addenbrooke suggested an alteration regarding auditors' duties, but this matter was referred to council.

W. M. Ashman proposed, and H. S. Mendelssohn seconded, to insert after address—"be ineligible for re-election for one year, after having served three years," instead of elegible for re-election. Not carried.

Capt. Abney proposed that the names of nominators be issued with that of their nominees.

T. S. Davis seconded.

A. Mackie thought such a proceeding would give some candidates undue influence if backed by several of the council.

A. Cowan was once placed in an invidious position by his name as a nominator appearing unsupported by others.

G. Davison regarded this amendment as a house list, practically.

Capt. Abney said the Society was bound to consider its country members, and they looked upon the recommendation of Council as a guide.

F. T. Beeson supposed country members would read up the work done by candidates, and vote accordingly.

J. Cadett thought the Society ought to guard against having another list like that issued last year, which he considered simply disgraceful, and would tend towards cliquism.

The Chairman:—No clique has ever existed in the council since I have been connected with it.

W. S. Bird wondered that any objection should be raised by the democratic party (if he might so name them) to the publication of the names of nominators. He thought it a most excellent safeguard against irresponsible nominations.

W. Bedford opposed the amendment, as also did S. G. B. Wollaston. It was then put to vote. Nineteen were in favor, and fifteen against.

The meeting was then adjourned until Tuesday, 25th inst., at 6 p.m.

Camera Club.

The paper read on October 13th was by Lyonel Clark, and was entitled "The Selection of Lenses." Francis Cobb occupied the chair.

Between forty and fifty members and visitors came together to hear and discuss the subject, which the lecturer illustrated by diagrams and by a complete series of lenses.

Previous to the paper being read the Chairman gave particulars, as far as agreed upon at the date of the second conference, proposed to be held by the Club in the spring of 1888.

H. C. Bond exhibited some very interesting old photographs and negatives, Talbotypes of the first exhibition in 1851; and T. Sage handed round an example of the ingenious little watch detective camera of Lancaster. The Chairman then called on Lyonel Clark for his lecture.

The lecturer followed out the laws of perspective that guide us in the selection of a picture, showing how lenses simply delineated what they saw. He pointed out the most suitable focal lengths for the different sizes of plates usually in use, and also spoke on the subject of the best form of lens to employ, whether for views, architecture, interiors, portraits, enlarging, or lantern work. He gave a few words of advice as to rules to be observed in choosing lenses, and recommended great care when the lenses had been bought. A large collection of different types of lenses were shown.

In the discussion which followed,

J. Traill Taylor made some remarks upon flare spot and upon several types of lenses, and said he had not much fear of the iris diaphragm of Messrs. Beck wearing so as to give flare, and even if it did it could easily be blackened again.

Dr. Lindsay Johnson thought the best black for the purpose of blackening the edges of the apertures of stops worn bright was gas-black. His favourite lens for all landscape work was the portable symmetrical.

F. Chambers referred to the ordinary uses of the rapid rectilinear and the wide angle lenses, and gave some particulars also concerning the triple achromatic lens.

J. C. Beck said the iris diaphragm had stood the test of long usage in microscopical work. He considered it a great objection to gas-black, that it rubbed off easily.

J. Spiers said one class of lens had been omitted, the pinhole lens. He had brought down two of his own manufacture, with prints from negatives taken by them. (The examples handed round were soft and pleasing pictures).

J. Traill Taylor said gas-black gave grey; the best to use was vegetable black mixed with lacquer. These used in proper proportions gave the most diabolical black conceivable.

On the 27th of October, Dr. G. Lindsay Johnson will read a paper entitled "Testing Lenses." Practical demonstrations will also be given, the apparatus for testing the lenses being arranged beforehand in the Club.

London and Provincial Photographic Association.

The usual weekly meeting took place on the 11th inst., C. Heinricks Trinks in the chair.

A series of views of Copenhagen and places *en route* were shown by L. Medland.

A short conversation upon the speed of shutters ensued.

The Chairman said that a rapidity of $\frac{1}{60}$th or $\frac{1}{100}$th of a second was quite practical.

A. Cowan said that to uncap and recap a lens as quickly as possible would occupy about $\frac{1}{5}$th of a second.

The Chairman had recently been adapting quick exposure shutters to photomicrography, and believed he should eventually succeed in getting instantaneous negatives of living organisms in motion. At present plates were too slow. He then detailed his arrangement of light, shutter, objectives, screens, &c., and suggestions with regard to the latter were made by J. J. Briginshaw, E. Plomer, A. Cowan, and others.

T. J. Collins showed a convenient adaptation of the roll-holder to his detective camera.

F. W. Cox brought under notice a complaint of some plates being insensitive at the margins. Imperfect washing of the emulsion, bad coating, and the plates not covered with developer, were suggestions made as to the probable cause.

Derby Photographic Society.

The annual meeting was held on October 11th, in Sykes's restaurant, Victoria Street, J. C. Merry presiding.

The Hon. Sec. read the annual report and balance sheet, which showed the Society to be in a flourishing condition, it now numbering 101 members, of whom 79 had paid their subscriptions; and the balance lying to the credit of the Society at Messrs. Crompton and Evan's bank had increased from £9 15s. 7½d. to £13 13s. 1d., and there were no outstanding debts. During the year a number of papers had been read, and demonstrations given by the members, and great benefit had been derived therefrom. Outdoor meetings had been held during the summer months at Dale Abbey, Marketon, Staunton Harold and Calke Abbey, Cromford and Matlock, Monsal Dale and Cressbrook Dale, Haddon Hall, Wingfield Manor, Alton, and Weston-on-Trent, and were well attended by the members. The Society instituted a competition for the best picture, taken at these outdoor meetings, to be decided by vote of the members. The pictures were arranged round the room that night for decision, which resulted as follows:—1st. Certificate to C. Bourdin for a view on Lover's Walks, Matlock, printed in platinotype; 2nd and 3rd, certificates to T. Scotton for view taken at Marketon, printed in platinotype, and silver print of "Hermit's Cave," at Dale Abbey. The competition was a keen one between Messrs. Bourdin and Scotton for the 1st certificate, the former obtaining it by one vote. The Society will print the best picture, and present each member with a copy.

The following were elected officers:—

President—Captain W. de W. Abney, R.E.

Vice-Pres.—R. Keene, J. C. Merry, J. W. Price, T. Scotton.

Committee—C. Bourdin, H. Bennett, T. Hills, W. G. Haslam, and C. B. Keene.

Hon. Sec. and Treasurer—E. J. Lovejoy, 73, Grove Street.

The question-box contained the following queries:—

1st. Will any member give the best mode of developing, and the best developer to use?

The Chairman thought it opened such a wide field for discussion that it had better be left over till next meeting.

2nd. Will any member give his experience in using different amounts of water in his developer?

It was thought if a member got a good developer, and was used to it, he should use no other; and the Chairman suggested that if a member take a plate, expose it, cut it into several pieces, and develop with different amounts of water in his developer, and compare the results, he would learn more by wasting one plate than from any information that could be given.

3rd. What is the action of the developer upon an exposed gelatine emulsion plate?

The Secretary replied that the developer continued the action set up by light, and developed the latent image.

4th. Must the bromide in an emulsion be in excess of the silver salt, or not?

The Chairman said the proper proportion of the salts would be found in one of the Year-Books, but he should like to remark that if sufficient bromide were not got in the emulsion, the silver was lost, and the opposite if an excess of bromide.

Birkenhead Photographic Association.

The ordinary meeting was held in the Free Public Library on the 13th instant, J. A. Forrest in the chair.

J. W. Simpson and E. M. Tunstall were elected members.

A lantern slide competition then took place. The offer of one of the Association's medals acting as a powerful incentive, a large number of members competed for the coveted prize. The work shown was of an unusually high order, and rendered the position of the judges (Messrs. Phillips, Sayce, and Whalley) anything but a sinecure. When the slides had all been passed through the lantern they announced that those bearing the word "Kingston" were, in their opinion, entitled to the prize. On the sealed envelope bearing a similar mark being opened it was found that Mr. Paul Lange was the winner.

In answer to a question, Mr. Lange stated that he had used the Kingston lantern plate with soda developer; he had found them more expeditious than chloride ones when reducing from large negatives through the camera, a consideration when using daylight in the winter months.

The judges regretted that the Association was only offering one medal, as they thought the slides of another exhibitor (John H. Day) were well entitled to a second prize.

The recognition of this gentleman's slides seems to confute a popular idea among photographers and dealers, that chloride plates will not keep for any length of time (hence, probably, the difficulty which frequently arises of procuring lantern plates during the summer), as it was understood that Mr. Day had used plates he had had in stock since last winter. He stated that he had found keeping to make them rather slower in sensitiveness than when freshly made, but as illustrated by his exhibit they showed no lack of vigour, and were unusually bright and sparkling.

Cardiff Amateur Photographic Society.

At a Council meeting held at the rooms on the 7th inst., the President in the chair, the revised draft scheme for the National Institute of Wales was approved, as also a reply to the letter of the Town Clerk respecting the accommodation the Society would require in the proposed Institute buildings.

It was resolved that a private exhibition be held in the Society's rooms at the November meeting, and that all members be earnestly invited to contribute, in order that the Society may judge whether they are warranted in undertaking a public exhibition or conversazione.

Talk in the Studio.

Photography Applied to Rifle Practice.—An officer well known for his zeal and ability in rifle practice urges us to set forth the advantages of photography as applied to that practice. In the assignment of officers to duty with the organisation of the pending competitions, one officer was detailed with reference to his ability to take photographs, &c., he having a complete apparatus and photographic stock. This, we believe, has not before been attempted. As this is a period when every target expert is interested in getting up something new to advance the interests of this specialty, we are glad to call attention to the value of photography. The "detail of the motion" of skirmishers can only be caught by quick photography. When a skirmisher manipulates his piece with such rapidity that he delivers a shot every two seconds and a fraction over, the detail of the motion and exact position becomes important. No one can stand by and with any certainty tell just what, and how, and when the skirmisher does certain things, but the photographer can. In the Bellevue camp, as we learn, there are several experts who have evolved individual methods of position, manipulation, &c., and they will hardly let the opportunity pass to take a counterfeit presentment of them in their attitudes. We may say that Lieut. Philip Reade, Gen. Terry's Inspector of Rifle Practice, has given special attention to this matter of photography.—*The Army and Navy Journal.*

A Significant Portrait.—Student Muller: "I want to have my likeness taken, but showing a back view." Photographer: "Why a back view?" Muller: "I am going to send one to each of my creditors as a memento before I leave the neighbourhood."—*Illustrirtes Sonntagsblatt,* translated in *Tit Bits.*

Photographic Society of Great Britain.—The usual monthly Technical Meeting of this Society will take place on Tuesday next, October 25th, at 8 p.m., when the apparatus now in the Exhibition will be shown and explained. Also on the same evening the adjourned Special General Meeting, for the consideration of the proposed new rules, will take place at 6 p.m.

A Manual of Composite Photography.—From Gauthier-Villars, of Paris, we have received *La Photographie Appliquée a la Production du Type, d'une Famille, d'une Tribu, ou d'une Race,* par Arthur Batut. Next week we propose to notice this work, and give some details as to composite portraiture.

The Eastman Company.—From this Company we have received a sample negative taken on the new stripping film. The negative is in no way inferior to one on glass, and can be printed from on either side, according as a direct or reversed negative is required. We have also received a description of the new form of the Eastman slide—said by the company to be an improvement on the roller slide we received and reviewed two years ago.

Photographic Club.—The subject for discussion on Oct. 26th will be "Orthochromatic Photography," on which a paper will be read by J. B. B. Wellington.

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Box Hill.—There must be some mistake, as chlorine would rapidly attack the apparatus. Probably carbonic acid was intended.

S. Tarleton.—A solution of ammonium sulpho-cyanate dissolves it much in the same way as warm water acts.

Geo. W. Stephens.—We have not seen the lens which is advertised under the name you mention. Your best way will be to offer to take one on approval, as, if the vendor is satisfied of the merits of his wares, he will have no reason to object to this.

B. T.—1. Readers will naturally suppose that the paper in question is at its wit's ends on account of its failure to be as acceptable as its rival, and that it therefore resorts to a method now almost discarded, because universally found to have an effect directly contrary to that intended. 2. Considering that anyone can so easily satisfy himself of the absolute untruthfulness of the statements, such a course would be superfluous. 3. That which you send is probably the only favourable notice which has appeared, and he virtually wrote it himself, although the manuscript which went to the printer was said not to be in his own hand-writing. 4. We will communicate with you on this point as soon as we know the result of enquiries. 5. According to our own estimate, the height should be taken at about 10 ft. 9 in.; but in the case of the top portion of the sheet, it is a little difficult to exactly locate the point of sight. In relation, however, to the lower right-hand part, the height is more than eleven feet. The non-agreement must, however, be obvious to any trained person. 6. We do not know the exact number, but not many short of one hundred. 7. They were made for him by A. L. Henderson, of London Bridge, who stands unrivalled for this class of work, and no account of the incident you refer to has been published, although various versions are subjects of conversation and gossip. 8. Try Debenham's method of reduction with hypochlorite. 9. We believe it is true, but cannot give you any absolute assurance. 10. A solution of ten grains of cyanide in one ounce of water.

Peter Brunsdon.—1. Probably next week, or, if not, the week after. 2. Send us details for insertion in the Year-Book.

F. E. Pollard.—We have no chance of saying very definitely how it is done unless we remove a portion from the mount, but we can say certainly that the colour is applied at the back somewhat after crystoleum method, and moreover the colouring is done very badly. The print has been returned according to your request.

Lyonel Clark.—The MS. and sketches duly to hand. Thank you.

W. Lawson.—The following quotation from an article which appeared in our issue of May 2, 1884, gives you the information you need:—"The gelatine which we have found most suitable for the Woodburytype process is that known as '*Coignet's Silver Label,*' and a jelly formed by melting one part of this in five parts of water may be taken as the basis of the gelatinous ink. Indian ink is ordinarily the main constitutent of the pigment used, and the tone of an ordinary photograph may be imitated very satisfactorily by the addition of indigo and alizarine lake. Much trouble may be obviated by purchasing these pigments already ground, and in the moist state; but it is still more convenient to obtain Newman's 'Colour for Carbon Printing' (24, Soho Square) already mixed to the required tint and tone. In very hot weather, or when it is desirable to remove the prints from the mould rapidly, the gelatinous ink may be used of the full strength mentioned (1 and 5); but it will, in all ordinary cases, be better to dilute it with about half its bulk of water. Having melted some of the gelatinous mixture, the moist colour is gradually to be stirred in until it is estimated that a layer of the mixture as thick as the greatest depth of the mould possesses just the depth of tone required for the dark shades of the picture. Of course, one can only make a very approximate estimate; but some kind of judgment must be exercised at this stage before testing the ink upon the mould."

Artist.—We cannot find room for all your remarks about the newspaper criticisms of your photographs. You should print the matter as a pamphlet, and send copies round to those whom you wish to convince.

Otto Pfenninger.—Thank you for your communication and the interesting specimen, concerning which we will say something next week, or will write to you in the meantime. If, when you write, you would use Latin characters instead of Gothic, we should feel much obliged.

A Beginner.—Fume your paper well with ammonia before printing on it, and make up your toning bath with cold water instead of hot water. To fume the paper with ammonia, you must saturate a pad of rag or other porous material with strong liquid ammonia, and shut this pad up in a box along with the sensitive paper, taking care that only the fumes reach the latter.

A. J. C. D.—Please send us your name and address, as we should like to have further information as to the matter. Certainly it is worth while to try and investigate so extraordinary a phenomenon.

M. and W.—Thank you for the suggestion. We will write to you.

Marion and Co.—In every case we shall be glad to have the blocks at the same time.

A. Treyer Evans.—The reproduction was made from a print, and there was no retouching; but some of the finer details were lost. The block was made by "Dallastype," a secret process.

Photo. Litho.—1. Albumenized paper answers very well if the coating of albumen has not been made insoluble, but it must be sensitized by floating the back upon the bichromate solution. Some samples of commercial gummed paper also answer very well. 2. As you do not say in what respect you failed, we cannot form any opinion. Merely to say that you failed, is not sufficient.

C. R. S.—1. Let us have particulars as to strength, and such other details as are necessary. The matter would be very suitable for publication as a short paper in the News or Year-Book. 2. Your letter has been handed over to the publisher, within whose department is this question.

R. S.—Captain Abney's "Instruction in Photography" contains what you want. It is published by Piper and Carter (the publishers of the Photographic News), and costs 3/6.

Fred F. Palmer.—The advertising department is totally distinct from the publishing department; still, we agree with you, and have done as you request.

J. Whitbourne.—Forty-five cells of Bunsen's battery will answer very well.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI, No. 1521.—October 28, 1887.

PATENT OFFICE

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COMPOSITE OR TYPICAL PHOTOGRAPHS.

In the last book which comes to hand from the firm of Gauthier-Villars—a firm which above all others has distinguished itself in the publication of photographic works—we have a short treatise on composite photography.*

Arthur Batut is the author of the work in question, and, after referring to the numerous services which photography has rendered to science, he speaks of Galton's system of composite photography as being, perhaps, more marvellous than the other applications mentioned, and yet but little known.

The author's short statement of the nature of a composite portrait will convey the main idea, although we may take it that our readers generally do not require to be told what a composite photograph really is. He says :—"Let us suppose the conditions are such that an exposure of sixty seconds is necessary for the copying of a carte-de-visite portrait in the camera : and it will be found that if we allow three seconds of exposure—that is to say, one-twentieth of the correct exposure—we shall obtain no trace of an image. Supposing, then, that we place twenty portraits of the same size successively before the camera, giving an exposure of three seconds to each, so as to give a total exposure of sixty seconds, the common characteristics of all will become impressed upon the plate, although no one portrait will be impressed upon the plate in its entirety. We thus obtain a photograph in which those accidents which modify the type of the race, or all those items which mark special individuals, are eliminated, and only those mysterious characteristics which belong to the race are perpetuated. Here we have no longer a servile operation of copying, but a marvellous piece of work—first analytical, then synthetical." The author, to show how perfectly this principle of working is in accord with the traditions of the artist painters, quotes from the *Grammaire des Arts du Dessin* of Chas. Blanc. Blanc says :—"The true method of idealising is to efface the purely individual features furnished by nature, and to select those which belong to the species—those which characterise generic life."

Batut first treats of obtaining the portraits which are to serve to build up the composite, and recommends the beginner to work by making composites of five or six members of the same family. He says :—"Place a seat in a conveniently lighted locality, and mark on the floor, with crayon, the position of its legs, so that the same place can be accurately found again. One of the models is now seated on the chair with the face directed towards the camera—that is to say, the two ears should show equally on the ground glass ; and, after having raised the apparatus to the level of the breast, you focus. This done, the position of the camera stand is marked on the floor just as in the case of the chair, and one focussing will, as a rule, do for all the sitters. In order to compensate for the varying heights of the sitters, it is convenient to use a chair with a rising seat, like the usual pianoforte stool.

Prints being now made from the negative, the author recommends the following method for insuring register in placing them successively before the camera for exposure.

One of the prints is taken and the pupils of the eyes are perforated with a needle, and a glass cutting shape, of which one side is ground, is placed in position, with the ground glass downwards over the print ; after which, by means of a finely-pointed pencil used at the back of the print, the positions of the perforation are marked on the ground surface of the glass cutting shape. The shape thus marked is then laid in succession on each of the prints, the dots upon it being made to coincide as nearly as possible with the eyes of the figure, when the print is trimmed exactly to the edges of the glass.

Dealing with the prints thus trimmed to register should be an easy matter to any of our readers, so we need give no further particulars of Batut's plan.

The work before us is illustrated with two series of portraits and composites therefrom, and forms a useful introduction to the study of composite portraiture.

Articles on composite portraiture giving very full details as to the modes of working, and illustrated with examples, have appeared in the Photographic News, and we may refer to our volume of 1885, pp. 243, 248, 259, 268, 352, 461, 512, and 793, for information and remarks on this subject. Still, it may be worth while to reproduce the following description of the apparatus shown by Galton in 1881 at a meeting of the Photographic Society.

The apparatus consists of three parts, A, B, and C. A is rigidly fixed ; it contains the dark slide and the contrivances by which the position of the image can be viewed ; the eyehole, *e*, already mentioned, being part of A. B is a travelling carriage that holds the lens, and is connected by bellows-work with A. In my apparatus it is pushed out and in, and clamped where desired, but it ought to be moved altogether by pinion and rack-work. The lens I use is an IB Dallmeyer. Its focal length is appropriate to the size of the instrument, and I find great convenience in a lens of wide aperture, when making the adjustments, as now I require plenty of light ; but as to the photography, the smaller the aperture the better. The hole in my stop is only two-tenths of an inch in diameter, and I believe one-tenth would be better.

C is a travelling carriage that supports the portraits in turn from which the composite has to be made. I work directly from the original negatives with transmitted light ; but prints could be used with light falling on their face. For convenience of description I will confine myself to the first instance only, and will therefore speak of C as the carriage that supports the frame that holds the negative transparencies. C can be pushed along the board and be clamped anywhere, and it has a rack and pinion adjustment; but it should have been made movable by rack and pinion along the whole length of the board. The frame for the transparencies has the same movements of adjustment as those in the stage of a microscope. It rotates round a hollow axis, through which a beam of light is thrown, and independent movements in the plane, at right angles to the axis, can be given to it in two directions, at right angles to one another, by turning two separate screws. The beam of light is furnished by three gas-burners, and it passes through a condenser. The gas is supplied through a flexible tube that does not interfere with the movements of C, and it is governed by a stop-cock in front of the operator.

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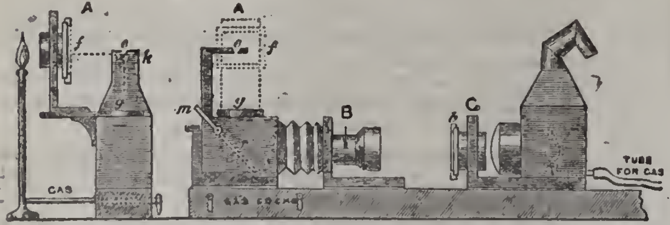
* La Photographie appliquée a la production du type d'une famille, d'une tribu, ou d'une race. Par Arthur Batut. Paris, 1887. Gauthier-Villars, 55, Quai des Grands Augustins.

My reflector in my present instrument is, I am a little ashamed to confess, nothing better than a piece of looking-glass fixed to an axle within the camera, near its top left-hand edge. One end of the axle protrudes, and has a short arm; when I push the arm back, the mirror is raised; when I push it forward, it drops down. I used looking-glass because the swing action is very true, and as my apparatus was merely a provisional working model, made of soft wood, I did not like to use sliding arrangements, which might not have acted truly, or I should certainly have employed a slide with a rectangular glass prism, on account of the perfect reflection it affords. And let me say, that a prism of two inches square in the side is quite large enough for adjustment purposes, for it is only the face of the portrait that is wanted to be seen. I chose my looking-glass carefully, and selected a piece that was plane and parallel. It has not too high a polish, and therefore does not give troublesome double reflections. In fact, it answers very respectably, especially when we consider that perfection of definition is thrown away on composites. I thought of a mirror silvered on the front of the glass, but this would soon tarnish in the gas-light, so I did not try it. For safety against the admission of light unintentionally, I have a cap to the focussing screen in the roof, and a slide in the fixed body of the instrument immediately behind the reflector, and before the dark slide. Neither of these will be wanted when the reflector is replaced by a prism, set into one end of a sliding block that had a large horizontal hole at the other end, and a sufficient length of solid wood between the two to block out the passage of light both upwards and downwards, whenever the block is passing through the half-way position.

Diagram showing the Essential Parts.



A The body of the camera, which is fixed. B Lens on a carriage, which can be moved to and fro. C Frame for the transparency, on a carriage that also supports the lantern; the whole can be moved to and fro. *r* The reflector inside the camera. *m* The arm outside the camera attached to the axis of the reflector; by moving it, the reflector can be moved up or down. *g* A ground-glass screen on the roof, which receives the image when the reflector is turned down, as in the diagram. *e* The eye-hole through which the image is viewed on *g*; a thin piece of glass immediately below *e* reflects the illuminated fiducial lines in the transparency at *f*, and gives them the appearance of lying upon *g*—the distances *f k* and *g k* being made equal, the angle *f*, *k*, *g* being made a right angle, and the plane of the thin piece of glass being made to bisect *f*, *k*, *g*. *f* Framework, adjustable, holding the transparency with the fiducial lines on it. *t* Framework, adjustable, holding the transparency of the portrait.

As regards the fiducial lines, they might be drawn on the glass screen; but black lines are not, I find, the best. It is far easier to work with illuminated lines; and it is important to be able to control their brightness. I produce these lines by means of a vertical transparency, set in an adjustable frame, connected with A, and having a gaslight behind it. Below eyehole *e*, through which I view the glass screen *g*, is a thin piece of glass set at an angle of 45°, which reflects the fiducial lines and gives them the appearance of lying on the screen, the frame being so adjusted that the distance from the thin piece of glass to the transparency and to the glass screen *g* is the same. I thus obtain beautiful fiducial lines, which I can vary from extreme faintness to extreme brilliancy, by turning the gas higher or lower, according to the brightness of the image of the portrait, which itself depends on the density of the transparency that I am engaged upon. This arrangement seems as good as can be. It affords a gauge of the density of the negative, and enables me to regulate the burners behind it, until the image of the portrait on *g* is adjusted to a standard degree of brightness.

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LEZARD'S PHOTO-CHRONOSCOPES.

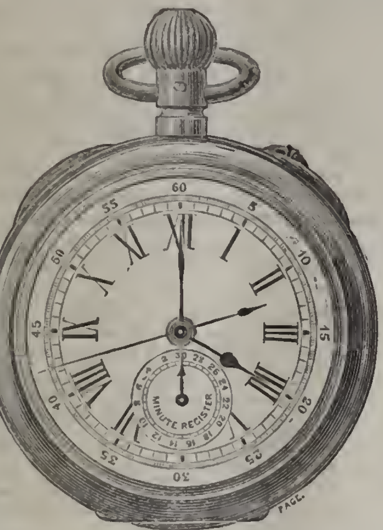
Among the apparatus now on exhibition at the rooms of the Photographic Society of Great Britain, one finds a case of time-measuring instruments, which merit special notice in relation to photographic work, these being contributed to the show by Lezard and Co., of 38, Viaduct Chambers, Holborn Viaduct.

Those who endeavour to time photographic operations by the mere inspection of the running hand of a watch, at the beginning and end of an event, know how great are the errors due to the facts that the eye must often turn from the watch face to the event, and back from the event to the watch face for the second reading, to say nothing of the distraction caused by the need to remember the two readings of the watch, and the difficulty of reading exactly from the seconds hand when in motion. The old-fashioned stop-watch was some improvement, as it could be started from a previously noted position by the pushing of a stud, and then stopped by a reverse action of the same, thus enabling the eye to remain observant from the beginning to the end of the event, and making the operator independent of light shining upon the watch face. Still, the stop-watch almost always failed to start in full swing immediately, and unless constructed with so excessive a motor strain as to make it faulty as a watch, it not unfrequently failed to start, thus frustrating the whole observation; moreover, in using a stop-watch, its setting to time is undone. In modern time-recording instruments, such as those constructed by Messrs. Lezard specially for the use of the photographer, the difficulties and objections referred to are altogether obviated.

In the first place, the time-keeping train keeps moving uninterruptedly, whether the chronographic part is used or not, so that even if constantly used for the recording of exposures or other events, the instrument remains an efficient timekeeping watch. Again, no observation of the instrument is required at such time as to interfere with due attention to the event; a push of the winding stud of the watch serving to start the chronograph action, and a second push serving to stop it, after which the reading of the period recorded may be deferred to any extent, as the hands of the chronograph train remain stationary. It will thus be seen that the photo-chronograph may be used as conveniently in the dark as in a lighted room, and moreover the instrument need not be removed from the pocket until the reading is to be taken; this reading being always single, and not involving a subtraction sum; as the chronograph hands invariably start from Zero.

We may now describe in some detail one instrument of the series; in fact, the instrument specially sent to us for notice by Messrs. Lezard, and that which, on the whole, is most likely to be useful to the general run of our readers.

Its general form and actual size are represented by the accompanying cut; indeed, at first sight, it looks like an ordinary keyless watch, but with dial a trifle small in proportion to the (silver) case. In addition to the usual hands of the going train, we have light central seconds hand which rotates once in a minute, and indicates a fifth of a second (shown in the sketch as at forty-two seconds and two-fifths); and a minute hand which indicates up to thirty minutes on the small dial marked "minute register." In the ordinary condition of things these extra hands are at rest, and standing at Zero; but when the winding stud is pushed inwards, the two extra hands are instantly thrown into gear with the going train, but a second push on the winding stud puts them again out of gear, after which the reading is made. A third push on the stud serves to make both the chronograph hands fly back to Zero, and remain there until they are brought into activity again by another push on the stud. It is desirable to leave the chronograph hands quiescent ordinarily, as otherwise there would be a needless wear upon their bearings. The movement of the going train is a lever of high quality, with a balance compensated for temperature. Indeed, such a watch as ten years ago could not have been obtained except at a price four times that now asked for the instrument with the recording addition—the present cost of the instrument before us being a trifle over six pounds. In fact, this instrument is practically the same as that presented to W. K. Burton on his departure for Japan, except that the case of Mr. Burton's instrument was of steel with gold mountings.



More expensive and finer instruments are shown in the case at the Photographic Exhibition, and one especially deserves mention. It has two central chronograph hands which start together at the first push on the button, the second push stopping one of them and registering the first of two periods; the third push serves to stop the other central chronograph hand, thus registering a second period; while a fourth push causes both central second hands to fly back to Zero. The movement of this chronoscope is individually adjusted for temperature, and rated so that in its action it is comparable to a ship's chronometer.

There are also in the case, some simpler instruments, containing only the chronographic action, one of these having two central second hands, and an extra dial showing one second at a revolution, this being indicated by four movements of the hand; but we are inclined to think that except when the instrument is required solely for the studio or enlarging room, most will prefer to have a watch movement combined.

We have found Lezard's photo-chronoscope especially useful in outdoor work (landscape work) at the present season, when the light is hardly bright enough for exposures so short as to catch trees and foliage in motion, and when it so often becomes necessary to resort to the alternative of a long exposure with a small stop. In such cases the exposure has often to be broken up into a number of short periods, the lens being uncovered for a few seconds from time to time, as wind and clouds permit; also in the case of copying or making lantern slides, when one has so often to close the lens for a period, out of consideration for the effect of vibration caused by heavy traffic outside. In short, so numerous are the uses to which the photographer—whether amateur or professional—can put the photo-chronoscope, that once having used it, he is likely to regard it as an essential item of his outfit.

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EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

Fourth Notice.

Amongst the very best of the group studies must be mentioned No. 59 ("Far from the Madding Crowd's Ignoble Strife") by Miss E. Boyer Brown. It shows a village smithy with the shoesmith at work. Apart from technical merits it is good, because it is real and natural, and does not recall a model posing to be photographed; and in this respect contrasts strikingly with Matthew Chubb's offensive burlesque "A Christian Martyr" (No. 70), this latter showing a partly draped young woman standing by a post while a loose untied rope encircles both.

Another delightfully pictorial scrap by Miss Boyer Brown is No. 185 ("Wiltshire Folk"), but both her exhibits are placed so high as to be quite out of easy view; and it is curious to note how many of the very worst things in the room are obtrusively placed on the line. One cannot help being pleased with W. W. Winter's "Dada's Tick-tick" (No. 60), a pretty little girl gleefully listening to the sound of a watch.

As a series representing really good legitimate photographic work, G. Davison's exhibits (Nos. 61 to 66) are noteworthy, the most striking being his "Pretty Hop Picker," and No. 64, "A Cottage Study."

Robinson and Thompson's "Last Load" (No. 71) is good, but not so attractive as the fine series of Italian subjects to be found farther on. Nos. 72 and 273 represent the work of J. C. Andreae; his photographs are little gems not only technically, but also pictorially.

As a scene of life and activity, W. L. Colls's "Sea Urchins" (No. 73) is capital—a group of merry boys bathing; and somehow or other the photograph conveys a distinct idea of motion. Three characteristic and well-executed views of Indian life are those of A. Isenberg, No. 74; but we cannot say much in praise of "A Spring Fancy" (No. 75), by W. Hayes. If ever a girl posed for her photograph, it is his model, who is supposed to be drawing water, but does not even look at the stream. As a specimen of real photographic portraits, Addenbrooke's "Portrait of a Lady" (No. 76) stands in prominent contrast to some of the show-case abortions which the hanging committee have allowed to be shown under such conditions as to lead the public to believe they are photographs. Why, may we ask, are so many examples of portrait work by the Cellerier Syndicate admitted? Certainly the work is good—much ahead of the usual run, because it is more photographic and less due to the manipulation of the retoucher; but a smaller number of specimens would have served just as well.

As regards the yacht photographs of G. West and Son, Nos. 79 and 85, one must speak very highly; indeed, to say that West and Son have issued them is equivalent to saying that they are good. The two rural views of E. B. Reeve (No. 86) are pleasing, but perhaps a trifle too black in parts; but his exhibit No. 606 pleases us still more. Lieut.-Col. Gubbins proves that he knows how to make those delightfully soft photographic pictures of outdoor scenes which English photographers have so long affected. His frame (No. 87) is worth more than a passing glance. "Aside from the Crowd," by G. Hadley, is a study of a woman reading, and has excellent points, while the next exhibit (87) is principally notable on account of the considerable proportion of the frame to the picture; yet in spite of this distracting influence, the real merit of the girl's head done on opal by the Autotype Company is such as to attract the observer.

F. Whaley attempts a difficult subject with his many figures in "Preparing for Boxing Night" (No. 91); he is evidently desirous to do something in the style of Jan Steen, and has made a good failure—a failure which may well encourage him to go on "His First Born." No. 206 is a less difficult subject, and he has been more successful.

Interiors by Bedford Lemere (No. 92) may be glanced at in passing, while those who can stoop to the ground may be gratified by No. 93 ("Shamming") and "Oh! yes, I'll have a Sweetie," by E. A. Maxwell. The little boy who shammed sleep is shown fully awake when the lollipop is introduced as a bait. Other work by Mr. Maxwell shows very distinct merit.

As a picture of a steamer forcing its way through the water and making foam as it goes, W. Parry's "Chilian Armour Clad" (No. 97) is good, and has a reality and vigour against which the sickly show-case exhibits (Nos. 102 and 103) react strongly.

Of George Hadley's exhibits, we think "Crabs Again" (No. 105), showing the disappointment of the boys at another unsuccessful haul, is perhaps the best—indeed, it is first-class as telling a story—while we look on No. 104, "Forgive us our Trespasses," as the worst; to say nothing of the unpleasantness of the idea of a child being taught to burlesque prayer before the camera. What a contrast is this feeble effort with Ellen Terry as Margaret in the Cathedral Scene at the Lyceum Theatre.

Simeon Norman's photographs of some of the architectural glories of Oxford (No. 106) would be the very best frame of architectural subjects in the room, were it not that two of them have been ruined by some cotton-wool-like markings about the sky—indeed, it looks as if a child had smeared something on the negative. It is always painful to see good work spoiled, and we hope Mr. Norman may be less unfortunate in the future.

A PHOTOGRAPHER'S HOLIDAY IN NORTH WALES.

BY W. JEROME HARRISON, F.G.S.*

Conway furnishes a rich mine for the photographer. Getting out at Llandudno Junction, we walk to the little island which helps Telford's chain bridge to cross the estuary of the Conway, and secure views of the castle from the base of the rock (mind the slippery sea-weed), and also from the little potato-garden at the top, giving a small *douceur* to the old woman who inhabits the toll-house for liberty of access thereto. Then crossing the bridge, we use a wide-angle lens to obtain a view of the entrance to the castle. Entering the grand old ruin, we secure fine negatives of its mouldering ivy-grown walls, the Welshwoman who sits here all day at her cushion, making lace, coming in very useful as an improvement to the "composition." Descending then to the picturesque quay, the vessels and boats form an excellent foreground behind which the castle rises grandly. Retracing our steps we climb the grassy slope on the other (south) side of the castle, from which we get panoramic pictures of the walls encircling the town, and of the castle and bridges. In Conway town itself there are some interesting old houses, especially Plas Mawr, but the latter is situated in a very narrow street. The visitor to Conway will find Mr. Owen Evans, in Castle Street, an excellent photographer and a kind helper, ever ready to afford the use of his dark-room for changing plates. His local views are excellent, and prints of them ought to be secured for guidance and comparison. It should be remembered that the dweller on the spot can select the most suitable day, light, &c., and from his work much can be learnt.

From Conway to Penmaenmawr is a magnificent walk through the Sychnant Pass (where a wonderful echo abides), and past the Fairy Glen of Dwygyfylchi.

Either Penmaenmawr or Llanfairfechan, the latter for choice, will be found excellent abiding places. Take Llanfairfechan; a glorious stretch of sand in front, lofty hills behind, cut through by ravines down which torrents run, coalescing to form a stream that flows through the centre of the village; great stone-quarries fret the sides of Penmaenmawr mountain, and Druidical circles and stones abound. Three miles further west are the lovely Aber Falls, approached through a wooded glen of rare beauty.

Soon we reach Bangor, an important point of departure, for from here we can get the steam ferry-boat to Beaumaris, with its Moorish-looking castle, or change to the branch line which, running south, will deposit us at the junction station of Afonwen on Cardigan Bay. This noble bay is skirted by the Cambrian Railway, whose termini are at Pwllheli (the next station west of Afonwen) and Aberystwith respectively.

But continuing on the main line from Chester to Holyhead we get out at Menai Bridge to examine and secure memorials of Telford's masterpiece. Views taken on the bridge illustrate splendidly the laws of perspective, and show a bewildering multitude of ties, and iron rods, and chains. The bridge itself is best photographed from the bathing-place on the rocks on the Anglesey side of the straits. Returning to the train we cross the south of Anglesey, noting the flat uninteresting nature of the country, a testimony to the tremendous planing power of the glacier which, during the last glacial epoch, descended from the Cumbrian Hills, pushed back the smaller Welsh ice-fields, and eroded the Menai Straits; and soon find ourselves at Holyhead. Here there is an interesting old church (St. Cybi's), and the harbour, docks, and breakwater offer fine opportunities to secure views of shipping, &c. But the photographer should above all things not miss seeing the grand cliff, precipices, and sea-caves at the South Stacks, about three miles west of the town. Here there is a lighthouse of the first-class, over which the visitor will be most courteously conducted; and if it happens to be the season, May to July, a wonderful scene of bird-life will be revealed to him. Guillemots, razor-bills, kittiwakes, and cormorants literally cover the rocks, and darken the air when they rise in affright at the report of a gun. They are, we are glad to say, strictly preserved.

We have now traced the main line from Chester to Holyhead, and tourists will find it to their advantage to take tickets to Holyhead, although they may mean to make their head-quarters, say, at Colwyn Bay or Llandudno. The tourist ticket to the terminus will only be a few shillings more, while the normal fare from either of the places named to Holyhead and back would be eight or ten times as much.

Of course every photographer who visits North Wales wishes to see and to ascend Snowdon. The mountain is accessible by three main routes: (*a*) from Llanberis (train service *via* Carnarvon); (*b*) from Capel Curig, passing Penygwryd (by coach); (*c*) from Beddgelert and Pont Rhyddu (the latter spot reached by train from Dinas, the next station to Carnarvon). I recommend visitors to ascend from Llanberis, and descend by either of the other two routes, or *vice versa*. The ascent is perfectly easy, but it is a long tiring two-and-a-half or three hours' climb, and a 5 by 4 camera is quite heavy enough to carry up. When you get to the summit, don't attempt the panoramic views which on a clear day stretch away to such prodigious distances; the cairn, refreshment huts, the ponies and their riders toiling up the last quarter-mile—these will be found to give far more satisfactory results.

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* Continued from page 621.

On the Cambrian or coast railway the photographer will find either Criccieth or Pwllheli very pleasant resting places. From the Midlands or North they are best reached via Chester, Bangor, and Afonwen; from the south through either Welshpool or Ruabon. At Criccieth, Edward the First's picturesque castle gives beauty to every view; it has been chosen by Captain Abney to illustrate one of the points of the chapter on landscape work in his classical book on "Photography," published by Longmans.

Pwllheli is farther from civilisation, and is a capital point from which to prospect the wild country which stretches west to Bardsey Island, Nevin, and Abersoch. There is a capital little harbour, at the mouth of which stands the great boss of diorite called the Gimlet Rock, and the fishermen are a hardy daring race.

But I feel that I have exhausted my space, and perhaps my readers, long before I have exhausted my subject. Yet there is one walk more—and let me advise the photographer to walk as much as possible; that is the true way to see a country—the glorious walk up the Aberglaslyn Pass from Portmadoc to Beddgelert; the last mile or two near Beddgelert is of unsurpassed beauty; however, "Gelert's Grave" is, photographically, and probably in every other sense, a fraud.

I have not said much about the Welsh people, but my experience of them, where uncontaminated by the constant pressure of the excursionist, is entirely favourable. It seems to me that neither Wales nor the Welsh have quite had justice done to them by the poet or the historian. But Shirley Brooks in *Punch*, many years back, summed up some of the salient points of the country so well that I cannot resist quoting a few of his lines:—

"By all Nantfrancon's beavers,
Of the pre-historic age;
By Aberglaslyn's hoary bridge,
And the Swallow's roaring rage;
By the trout of Capel Curig,
By Carnarvon's eagled tower,
The smile of placid Tan-y-bwlch,
And the frown of Penmaenmawr;
By yon lonely Puffin Island,
And the monster head of Orme,
The Castle of the beauteous Marsh,
Llanboris, Pass of Storm;
By the magic bridge of Bangor,
Hung awful in the sky;
By the grave at sweet Beddgelert,
Where the martyr-hound doth lie;
By the lightnings that on Snowdon
Glint, the jewels of his crown;
Stand up, brave Taffy, for thy right,
And never be put down."

From a "picture-making" point of view I consider North Wales to be superior to either the lake district, Scotland, or the Continent. The country seems to compose better, and there is a larger proportion of "rock, crag, water, wood, and ruin"—those beloved ingredients—with fewer bare barren expanses than I have seen elsewhere. My advice is, "Try North Wales," and when you have tried it once, you will not need to be recommended to "Try it again."

HOW TO MAKE LANTERN SLIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.[*]

X.—Photo-Micrographs as Lantern Slides.

Few lantern slides are more beautiful or more interesting than those made from good negatives of microscopic objects. Unfortunately, *all* microscopic objects are not suitable for making photo-micrographs. Photography, at present, is so imperfect, that many strongly-coloured microscopic objects are but imperfectly depicted by it, and, until we get the power of truly translating colour into the monochrome of the photograph, we must still have recourse to the camera-lucida. Before photo-micrography attained its present deserved position among scientific men, workers with the camera-lucida spared neither time nor trouble to portray many of the marvellous and exquisitely-beautiful objects revealed by the microscope, and, consequently, drawings of microscopic objects of the very highest class are abundant. In English, we may mention the works of Andrew Pritchard and Richard Beck; and in French, amongst a host of others, the microscopic drawings of Dujardin. Many of these are so delicately and faithfully drawn, that, in some respects, they surpass the best results of photography.

Still, in spite of its shortcomings, photography has so much to recommend it in preference to any kind of drawing, that scientific men are now largely employing it for depicting the minute forms of life, such as the organisms known as bacteria, bacilli, &c. These microscopic organisms are so minute, requiring the very highest power of the microscope to define them, and, to the unpractised eye, are so much alike, that it would require an artist of the highest skill and intelligence, and accustomed to microscopic work, to represent them with fidelity.

It is not, however, of the use of the highest powers of the microscope, nor of photographing minute and difficult objects, that the following pages are going to treat. Those who are expert photo-micrographers will find all necessary information on photographing bacteria in Dr. Crookshank's recently-published works, in what Dr. Maddox has written in Dr. Beale's "How to Work with the Microscope," and in his chapter on photographing bacteria in the writer's little book on "Photo-Micrography."

Anyone who can manage a simple photographic operation, and who can use a microscope, will be able, after a little practice, to produce negatives of easy microscopic objects that will make interesting lantern slides. The larger diatoms and the beautiful entomological and botanical preparations to be obtained at any optician's will furnish plenty of material for work.

A good microscope stand is the first desideratum. This need not be an expensive affair, but a good, firm, solidly-built instrument costing five or six pounds. It should be purchased from one of the best microscope makers, not from a dealer, for there are many wretched things sold as microscopes, both in London and the provinces, by dealers in all sorts of apparatus, that answer very well for mere amusement, or as a boy's first microscope, but are utterly unfit for real work. The stand should be purchased *without* lenses or any apparatus, and this is the way microscope stands are sold by the maker. The lenses and other accessories can be purchased to suit requirements. The price paid for the stand should not be *less* than five pounds, but may be as much more as the purchaser can afford. Dr. Carpenter's book on the microscope—which should be in the hands of every microscopist—or Mr. G. E. Davis's "Practical Microscopy," give sound advice as to the choice of an instrument.

The lenses must be chosen to suit the work to be done; if entomological or botanical preparations are to be photographed, lenses varying in focus from 4 inches to ¼ inch will be sufficient. If money be no object, the very best lenses should be obtained—of English make, and from some optician of repute; but if these prove too costly, the cheaper low-angle lenses sold by all our opticians will answer for nearly all requirements.

As it has now been conclusively proved by many of the best photo-micrographers that the use of the eye-piece does *not* deteriorate the photographic image, and adds much to the convenience of working, a long camera will not be required. In working *without* the eye-piece, a camera capable of extending five or six feet is necessary; while using the eye-piece, a shorter one extending to ten or twelve inches is all that is required. The "long focus cameras," now sold everywhere, will answer admirably, especially if of quarter-plate size. The Sciopticon cameras, already noticed, are especially suited to the wants of the photo-micrographer, and have been used by many for this purpose.

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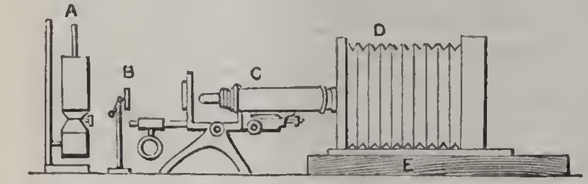
[*] Continued from page 663.

The arrangement of the apparatus for taking photo-micrographs is very simple. The microscope is placed in the horizontal position, and secured either by means of a clamp, or by a rest-piece, as in the microscopes manufactured by Messrs. Swift. The rest-piece, or stop, is preferable to the clamp, as, when the microscope rests on the stop, it is truly horizontal, which is essential in taking a photograph. The camera should be screwed to a heavy block of wood of sufficient thickness to raise the lens-hole exactly opposite the eye-piece of the microscope. If one block does not raise the camera high enough, several blocks may be employed; but do not use books to support the camera, as with these it is impossible to get the camera level, and they form a very shaky support.

Now place a paraffin lamp, with as broad a wick as can be obtained, about six inches in front of the aperture in the stage of the microscope. Screw on a suitable object glass, and place the object on the stage. Bring it into position, either with the fingers or with the screw motion, if the microscope possess a mechanical stage, and secure a correct focus. Next adjust a bull's-eye lens between the lamp and microscope, so as to concentrate the light on the object. When all looks satisfactory, and the field appears fully illuminated, slide the camera up to the microscope, pass the eye-piece end of the tube through the lens-hole, and exclude all stray light by wrapping black velvet round the join, and secure it with elastic bands. The arrangement is shown in the illustration.



A, lamp; B, condenser; C, microscope; D, short camera; E, block to support camera.

If a low power be used, a good focus can be secured on the ordinary ground-glass screen, especially if its opacity has been reduced by previously warming it before the fire, rubbing it with white wax, and cleaning off with a piece of linen rag. A screen thus treated may be used with powers up to the quarter-inch. If a high power be used, the ground-glass should be replaced by a piece of plain glass, and the focussing be performed with a focussing eye-piece.

If the illumination be even, and sufficiently strong, the whole of the screen will be well lit up, but the object on the stage will appear indistinct and blurred. Now take hold of the coarse adjustment of the microscope, and carefully bring the object into focus; a *good* coarse adjustment will focus an eighth-inch objective correctly. When properly focussed, shut off the light by a black card placed before the lens, or below the stage, according to the objective used, and place the dark-slide in position and draw up the shutter. Wait a few seconds for any possible vibration to cease, and then expose the plate by taking away the card. The exposures must be learnt by practice. When sufficient exposure has been given, replace the card before the lens, close the shutter, and take the plate away to be developed.

In developing photo-micrographs, great care must be taken to bring out all possible detail, or the negative will not be fit for making lantern slides. Begin with a weak developer, and gradually increase its strength, and be sure that all the delicate details are brought out before full density is secured. Dense negatives are best for making lantern slides, and it is easy to secure proper density if a soda developer be used. Some workers prefer ferrous oxalate for developing photo-micrographs, and a few experts secure good results; but the writer thinks that pyrogallic acid will answer better in most hands.

When the photo-micrographs are designed especially for lantern slides, the simple apparatus described is not only sufficient for the purpose, but will answer far better than a larger and more complicated affair. It is very unsatisfactory to be obliged to work with a large camera when pictures only lantern size are desired. It then becomes necessary to use carriers for the small plates, and these frequently are a source of annoyance and trouble. The pictures made on small plates, either lantern size or quarter plate, are quite large enough to make interesting prints, and, for exhibition, fine enlargements can easily be made on bromide paper. It is much easier to get a small negative sharp from edge to edge than a large one; but in photo-micrographs intended for lantern slides, a much higher degree of sharpness is required than in those which are to be used merely for making silver prints. Not only must the negative be absolutely sharp and full of detail, but it must have been evenly illuminated, and thus of even density from edge to edge. Weak and under-exposed negatives are simply useless.

It is no doubt a more difficult matter to make a good negative of a microscopic object than to make a good landscape negative; but practice and patience will overcome every difficulty, and perseverance in the work will produce a set of lantern slides of the highest scientific value and interest.

(*To be continued.*)

PRESS NOTICES OF THE PHOTOGRAPHIC EXHIBITION.

The *Builder* says :—

The annual exhibition of the Photographic Society of Great Britain, at present open in the rooms of the Society of Water Colours, contains a good many things that are really worth looking at for their success of execution or for the beauty of the objects which they represent; and though the interest which this exhibition excites is cold indeed compared with that aroused by the class of exhibitions which we are accustomed to see in these rooms, the very contrast of feeling naturally suggests some reflections as to the contrast between these two methods of representation, the chemical and manual, and what photography can and cannot accomplish.

The days are long past when photography offered to us as representations of landscape only some half intelligible assortments of masses of dark and light. Comparatively speaking, the advance of late years is wonderful in this department of photographing; and a good many of the landscape photographs can be really enjoyed for their intrinsic beauty of representation. In almost all cases, indeed, it would seem that something is lost; one point is sacrificed to another, except where the scene offers special circumstances peculiarly suitable to be dealt with by photography. "A Frosty Walk" (31), for instance, by Mr. H. Tolley, represents a phase of nature, the groumd whitened by hoar frost, which falls in admirably with the special powers and the characteristic tone of photography. In "At Ilam, Derbyshire" (52), by the same exhibitor, the main point in the picture consists in the complex and delicate ramifications of the boughs and twigs of a bare tree, which form a network across nearly the whole surface of the picture, leaving the landscape to be seen through them. This anatomy of the tree, caught in every detail with the greatest sharpness, is an exquisite object in itself, and it is of real value in another sense, as a record of natural fact more elaborate than any painter could emulate by the labour of the eye and hand. "Falcon Crag, Derwentwater" (235), again, by Mr. T. A. Green, is composed in this way of a foreground tree, a noble tree, and a distance retiring behind it; the distance is beautifully soft, but we fancy something of it has been lost, and that the softness is really incompleteness; nevertheless, the result is beautiful in its way. Mr. Scamell's "Cottages at Steventon" (557), with the minute elaboration of the foliage and the broad mass of white light on the houses, is a most effective little bit, and here, it will be observed, there is no distance at all, and this is just one of the scenes in which photography succeeds best. Mr. Green's "Head of Buttermere" (236) is very soft and aerial in effect, but, as in many of these soft and rather misty views, the sky is lost, or only seen in faint and uncertain indications of cloud forms. One must except also the water from the foreground of "Cottages at Steventon"—water appears to be in every case and under all circumstances a failure in photography. We have not found one successful example in this collection. Smooth water, giving much reflected light, becomes woolly in texture and loses all hint of water; rough water looks only like a dry, wrinkled surface. Instantaneous renderings of breaking waves or surf, as in "A Ground Swell" (462), by Mr. W. P. Marsh, show the sensitiveness of the modern plate, which can catch a wave actually on the curl, but as a representation of water it is valueless, almost disagreeable to look at, except solely as a business record of facts of form which a sea-painter may perhaps find useful to refer to. Among other landscape subjects which are successful may be mentioned the two platinotype photographs "On the Thames" (425), exhibited by the School of Military Engineering, the lower plate especially; two by Mr. F. M. Sutcliffe (548, 549), the first a fine little scene carefully chosen for effect—two trees on a ridge of down near the foreground, and a cloudy evening sky behind, a photograph into which something like poetic feeling has been conveyed; "View of Moel Wyu from Festiniog" (535), by Mr. C. E. Nesham, in which the large extent and aerial perspective of the hills is finely reproduced, though the sky seems to have been lost; "The Lea at Ware" (552), by Mr. Edgar Clifton, a carefully-chosen subject, with an old barge in the foreground—artistic feeling is shown here in the choice of subject and point of view, at all events; "Dunluce Castle" (219), by Mr. Vernon Heath, of which the same may be said; and "Carolling," by Mr. H. P. Robinson (40), a landscape with two figures walking through fields, in which the landscape has really the softness and distance of a water-colour painting, but we imagine this has been touched upon, and is not pure photographing work.

The figures in this last, however, jar upon the sentiment of the scene; they are supposed to be two rustic women singing as they go through the field. Mr. Thorne Waite, or Mr. Tom Lloyd, would have made a couple of expressive figures of them, in harmony with the feeling of the landscape; here we are brought down to the plain prose of commonplace everyday life, and the result is a total failure. The study of this, and of a good many other photographic subjects compiled with similar aims, is very instructive. It shows what we owe to art and artists in the production of the rustic idylls which form such a prominent and such a generally beautiful portion of our water-colour exhibitions. The photographers are very fond of trying to do the same thing, and the failure in most instances, where the picture is simply a direct chemical transcript from nature, is complete, and in many cases almost ludicrous. "A Pretty Hop-picker" (63) seated on a stile is not pretty a bit; her face is a dead dull blank. Mr. J. Gale shows some cottage or rural scenes with figures—the most successful being "Saturday Afternoon" (249), where he has been rather fortunate in his figures, and the broad mass of light on the white cottage is a good piece of effect. In others, such as "Too Wet for the Woods To-day" (245), the figures of an old woman leaning over the gate, and a man coming up to it, are simply vulgar. We can fancy what Mrs. Allingham would have made of them; and the same thought occurs in reference to "St. Catharine's Hill, Guildford" (61), a charming nook of landscape with a little girl seated in the midst of it just in the spot where "the figure" is wanted—it is all right so far; but the common, inexpressive countenance of the child spoils it; the artist's hand was wanting. So again in "The Secret" (553), by Mrs. Payne, a little girl and boy; a charming expression has been caught in the former, but the boy's face looks dull and sulky. Photography, in fact, gives in general the commonest and poorest expression of the countenance; the artist seeks out and gives the best expression; and there is the gulf between photography and art, or at least a part of it; for the still greater and essential distinction lies in the delight we all find in creating ourselves, or in studying the creations of others. Photography merely copies; the artist—even the most nominally realistic artist—does far more than copy: and nowhere can this distinction be more clearly seen and more strongly felt than in studying the efforts of photographers to produce pictures of human life. "Home, Sweet Home" (41), an interior by Mr. Lyddell Sawyer, is another, we might almost say flagrant example; the little bunched-up figure of the child held up in its father's arms is capital, and would be worth the attention of a painter, but the figures and physiognomies of the parents reduce the whole thing to sheer vulgarity.

Among really successful figure scenes we may, however, mention the little sleeping child, "Tired out" (482), by Mr. R. W. Robinson, a perfect little picture just as it is.

In what has been with the public the great and popular function of photography, the taking of portraits pure and simple, there are some brilliant successes. Among these the three "Studies," by Mr. M'Leish (292) are admirable; the photographer has been fortunate in his subjects, but he has also known how to light the profile portrait of the beautiful young girl on the right so as to give the most brilliant and striking effect to it. A medal has been awarded to another series of large portraits by Mr. W. J. Byrne (283), but from the artist's point of view these are not so good as No. 292, and in particular in the centre figure of the girl's head, nearly life-size, the modelling of the mouth has been quite lost.

As on former occasions, architecture, which of all classes of subject lends itself best to photography and loses least by any defects of the process, is the least represented of any class of subject. There is a fine and remarkably sharp view of St. Paul's Cathedral (20) by Mr. J. Bracebridge Hilditch, which, considering that it is an enlargement from the original negative, is a triumph of clear definition. It has been touched upon here and there with white for high lights, but so obviously as not to constitute any deception. Mr. Richard Keene shows some "Interiors of Osmaston Manor" (4); Mr. W. Webster some interiors of "Eaton Hall" (21); Mr. Salmon has some good photographs from St. Bartholomew's and other City churches; Mr. T. M. Browning gives a good view of the Ponte Vecchio at Florence; and Mr. Bedford Lemere has been successful in producing some very elaborate interior detail from rooms in "Beau Manor" (92). Perhaps the most remarkable of all the architectural photographs for sharpness of definition are the two by Mr. Mold of interiors of St. Mary's Church, Banbury (189 and 432), a classic interior which appears to have undergone recent decoration. Considering the difficulties in regard to light in interiors, these may be called extraordinarily successful. But we should recommend the Society to pay more attention to architectural photography, especially of ancient works, in their exhibitions; there is no class of subject in which their work can show to more advantage or be of more value.

Among the curiosities of the exhibition is an architectural curiosity also, a photograph of a real contemporary series of lake dwellings, in full occupation, at Tupuselai, in New Guinea (404). Any architect visiting the exhibition would find it worth while to look at this. There are various photographs of flashes of lightning (but these are getting common now); photomicrographs of minute objects from plant and insect life by Mr. F. H. Evans, for which the exhibitor has received a medal; the photograph of the claws of the house-spider, magnified 240 times, is one of the most remarkable and successful of these. Mr. G. W. Webster has some how succeeded in photographing a couple of skylarks and their nest, the one bird on the ground, the other just hovering down; how he managed to get so close to the birds as to secure the photograph without frightening them away is the marvel; but the bird in flight illustrates one of the weak points of instantaneous photography: the bird's wings seem stationary, just as in the case of the instantaneous photograph of an express train which we noticed on another occasion; all idea of motion is taken away—wheels and wings alike are stopped dead. Mr. Sidney Tebbutt shows a photograph taken on a moonlight night in Saxony—"full moon and cloudless sky, exposure three hours, from ten p.m. to one a.m."; but here again photography fails—it conveys no idea of moonlight; the lens, in fact, sees more than the human eye can, and as we mentally refer to our experience from actual vision, the photographic result appears false though in scientific sense it may be true enough. On the whole, the more we study photography, the more we feel how far removed is real art from mere imitation of nature; how much of the pleasure we derive from painting springs really, unknown perhaps either to spectator or artist, from that expression of the artist's own mental mood, and that sympathetic response to it in the mind of the spectator, which mere photographic reproduction is powerless either to express for the one or to awaken in the other.

Notes.

A story has been circulating about a well-known artist, who went into a studio to have his portrait taken, and entered into casual conversation with the operator about some photographs on the walls. When the bill for the photographs was sent in, the artist was surprised to find an item, "To lesson in photography, 10s. 6d." Perhaps several professionals have treated their customers in this way, and, may be, several will take this story to self; but we really know of one case in which it was done. Still, we know of at least twenty professionals who are always really pleased when they can give an amateur a useful hint; and, so far from sending in a bill for 10s. 6d., will not hesitate to use plates and materials to illustrate their words. If any one doubt this, let him go to one of the meetings of the Photographic Club, and ask the professionals who attend the meeting to give him information.

Last Tuesday, when revising the rules of the Photographic Society was in progress, it was quite unexpectedly suggested that it would be an enormous improvement if the exhibition judges were elected not by the Council, but by the whole body of members; and the murmur of approval which went round the room clearly showed that the meeting was in sympathy with the suggestion.

Perhaps never before was there such widespread and freely-expressed dissatisfaction with the awards of the judges, both as regards the awards to the photographs and to the apparatus; although the judges of the apparatus have certainly been more universally blamed than the judges of the pictures. As regards the award of a medal by the former to a very questionable production, we have heard difference of opinion; but as regards the award of a medal by the latter to the plate box of Arundell and Marshall we have only heard expressions of dissatisfaction—a circumstance which certainly surprises us.

When it was put to the vote whether the Council should be requested to formulate a draft of a rule vesting the power of electing judges in the hands of the whole Society, not a hand was held up against the motion, and such expressions as "No more favouritism now," were heard in various parts of the room.

The electric light for the optical lantern at the Photographic Society has been fairly successful, but not a marked success. On Monday, when the Amateur Field Club showed slides, the disc was but seldom fully illuminated. Now and again, when the arc was at its smallest, the light was bright enough, but as the carbons separated, and the arc became longer, the screen presented a mottled and clouded appearance that must have given but small satisfaction to the exhibitors. The average of the slides was high, perhaps the best being those by Gale and Dav son. Burton Barber showed an admirable picture of gulls in the snow; Wainwright had cleverly caugh the hippopotamus opening his cavernous jaws; Seymour Conway showed some exquisite views from Wales and the lakes; and the evening concluded with some fine Swiss scenes, announced by a voice from up by the lantern as the work of "Mr. Donkin, that is to say, myself," an announcement which secured the popular hon. secretary a round of applause.

Boucicault's famous photographic scene in the *Octoroon* has been paralleled by the author of an Arctic story now running in a youths' paper which has a wide circulation. The photographer, having been conveyed to an ice floe, sets up his camera, and is represented as "adjusting the lens with his gloved hand," with his head "under the curtain" (*i.e.*, focussing cloth). Suddenly he exclaims, "Why, what is the meaning of this? Everything has suddenly become blurred and yellow." However, he does not withdraw his head from beneath the "curtain," as ordinary photographers would do, until violently pulled by the coat tails by a companion. He is then told that an immense Polar bear has been standing within six paces of the camera. This bear he does not see, "because the creature's just slipped back into the sea," says his companion, adding, "Please look in the camera." Then follows this remarkable statement from the photographer: "You are right," he said, after a moment's examination; "a splendid negative. What a magnificent animal! I should not have believed it possible." We should think not, indeed. The photographic readers of the journal in question—and there are several, to judge by the correspondence columns—must have had a quiet laugh at the expense of the author.

Paris has just been reading with painful interest the confidential report in which the Procureur of the Republic makes his final statement on the Opera Comique fire; and points out, with grim impartiality, the relative share of the blame which he considers the various inculpated individuals ought to bear. Into the general details of his report we have no intention of entering; but there is one part of it which is especially interesting, as showing once more the important part photography plays as a modern detective. It is, indeed, depressing to read that although the ill-fated theatre was provided with a variety of appliances for extinguishing fire, none of these appliances were used. There were hydrants in all parts of the house; there was a large reservoir on the roof; there was a plentiful supply of water everywhere; but—and here comes the damning indictment—not one drop of water was thrown on the fire when it was first discovered. In fact, the report goes on, the hose remained uncoiled, the taps unturned, the fire plugs unopened; and then comes the proof of these startling declarations. The Procureur, it seems, before any attempt was made to deal with the ruins, had each part of the fire-extinguishing apparatus referred to photographed; and, as he states emphatically in italics, as an answer to those who may be inclined to doubt his serious allegations, "*Le photographies en font foi.*" It will be remembered that photographs were taken in a similar way after Whiteley's fire, and it would surely be a good plan to always set the camera to work when there has been a suspicion of foul play.

Take, for example, the case in which a Strand hairdresser was lately charged with arson. Reference was made in the recent proceedings to the discovery of certain combustible material, and of other suspicious-looking details; and it seems to us that if the prosecuting counsel had been able to "put in" certified photographs of the items referred to, the matter might have been made much more clear either for or against the prisoner; for it by no means follows that the camera would always be a witness for the prosecution. Its negative evidences might sometimes tell for the defendant as well as for the plaintiff: the satisfactory part of the matter being that it could not well fail to have assisted the cause of justice, whichever side it may have aided.

The best of Verestschagin's pictures are undoubtedly those which illustrate incidents in the Russo-Turkish war. From their absence of "arrangement" they have a strangely photographic look. Verestschagin has been content to take things as he found them, and he has rendered them literally. At the same time, he has not been repulsive. His pictures have not nearly that blood-stained aspect which some critics have found in them. "The Conquered" is sufficiently ghastly from the association of ideas, representing, as it does, a vast grave with some of the bodies of the dead soldiery scarcely covered; but it is not repulsive in itself. The figure of the priest attended by a solitary soldier is strangely pathetic. "After the Battle" is a picture of the wounded, just as the camera would represent them, lying in huddled groups without any attempts at artistic effect. "All Quiet at Shipka," a series of three pictures showing a Russian sentinel slowly dying at his post, and finally dropping down in the snow in that fatal sleep produced by intense cold, is wonderfully rendered. "Before the Attack" is also a realistic picture which gives one as good an idea of the grim realities of war, as the brush can possibly do. Verestschagin must be a rapid worker. Indeed, this is curiously shown by the photographs of the Central-Asian pictures. The absence of elaboration and minute detail is here evident. The painter seems to have been contented with his broad vigorous outlines, and to have dashed in the colour with as few brush marks as possible.

As Verestschagin's strong point is his power to portray rapidily and correctly what he sees, such a picture as the execution in India, showing natives about to be blown from guns, seems artificial and even theatrical. Verestschagin's age has not been given, and as the scene portrayed took place thirty years ago, he must, had he been an eye witness, have been very young. The production of such a picture by a lad, say, of twenty would have been nothing short of marvellous. It now appears from some correspondence which has taken place that many details are wrong. The men were not tied as represented; they were Hindoos, while Verestschagin has made them Mahomedans; and the uniform and guns are of a modern type. Mrs. Graham (the wife of General Graham, an Indian general), who gives these particulars, adds that "M. Verestschagin's picture of the Motu Musjid, Delhi, is a simple enlargement of a photo (with the exception of the figures) which she has in her possession. Even the angles of the shadows are, curiously enough, identical." One is tempted to ask whether Verestschagin had with him a camera during the Russo-Turkish campaign. The use of it would not detract in the least from the merit of the pictures, and the question is merely asked because some of the paintings are, as we have remarked, very suggestive of photography.

ON THE IMPROVEMENT OF OVER-EXPOSED NEGATIVES.

BY EDWARD DUNMORE.[*]

According to promise, I will now tell you of the very simple plan I have adopted for rescuing weak, over-exposed negatives from the waste—a process so simple that I hesitated to say anything about it until I had made inquiries if this or any other plan had been successfully adopted for the purpose, or if, on the contrary, the greater portion of such defective negatives were considered irremediable failures and looked upon as worthless, from a printer's point of view, at any rate. The only way of getting any passable result from a thin, over-exposed plate (if it was considered worth the trouble) was by making a transparency and copying that—a roundabout process, you must admit, if the original negative can be so altered and improved as to do away with the necessity of reproduction.

The process I am about to recommend is free from difficulty, being little else than already well-known processes somwhat differently applied; it is, in fact, so simple, that one is forcibly reminded of the incident of Columbus and the egg. Negatives which by this plan can be satisfactorily treated are over-exposed ones, of which a goodly number are, no doubt, in existence, but a plate chemically fogged, or one to which the light has had access before exposure, would probably not be amenable to this treatment; however, I have not made any experiments to verify the opinion. Some improvement possibly might be made, but as to making a perfect negative of such, it is extremely doubtful, whereas in the case of over-exposure it is an undoubted panacea.

If an ordinary over-exposed negative is intensified by any known method, it may be somewhat improved, but, at the same time, the deposit in the shadows will gain in strength, as well as the lights, and the result will be a very dense slow-printing negative, and one from which perfect results are unlikely to be obtained, although somewhat better than the original before intensification. The effect of over-exposure is, we all know, to gradually obliterate the image until a point is reached when a reversal of it takes place, and the negative becomes a positive. It must be clearly understood I refer to the ordinary methods of development. In the development of a properly exposed plate, the reduction is first on the outer surface of the film, into which it gradually extends until the most reduced parts are visible at the back of the plate. If the development is continued for too long a time the portions much less acted upon by the light begin to show at the back also, and the resulting negative is too dense; this, however, depends in a measure on the thickness of the film. A proper development is one that gives sufficient density to the high lights without blocking up the shadows. The negative image in the gelatine film may be looked upon as a series of images in different strata overlying each other, the strongest lights penetrating lowest and deepest, and the deepest shadows passing scarcely beyond the surface, and sometimes not so much as appearing to affect it at all. It therefore seems that the thickest films most rich in silver salt should give the strongest image with ordinary development; on the contrary, with a thin, poor film it is difficult to get a good, rich printing image with clear shadows, and the chances of blurring and halation are greatly increased.

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[*] A communication to the Photographic Club.

Given, then, an average good plate and over-exposure, my idea is to remove the outer layers sufficiently deep to leave clear glass in the deepest shadows, and then intensify the remainder The way of setting about it, and which I have found answers perfectly, is the following. Other plans, doubtless, might be adopted to effect the same result, but as the one I tried fully answered my expectations, I thought further search unnecessary. The appliances required are few and simple, being limited to a white dish and a lamp. A solution of five grains of hyposulphite of soda to the ounce of water in one receptacle, and a solution of the same strength of ferricyanide or red prussiate of potash in another, with plenty of clean water at hand, being ready, the negative to be operated on must first be carefully examined, and some part that we know should be nearly, if not quite, clear glass specially noted, as this will form the key to the reduction. The negative is now laid face uppermost in the white dish, the lamp being arranged to throw as good a light as possible on it. The hypo and ferricyanide solutions, being mixed together, are poured over it, the dish being gently rocked, and the process of reduction, which soon sets in, intently watched, and as soon as the portions noted at the beginning as the deepest shadows permit the white of the dish to shine through, remove the negative and immediately well wash it. It is best to stop a little short of the full effect desired, for the action will continue a little after removal from the solutions. A bit of white paper pressed against the back of the negative will aid in deciding if the reduction has been carried far enough ; if not, it may be redipped until it has. Now well wash. Soak for an hour in several changes of water, and dry now if, on a thorough examination, the reduction has been considered right. Intensification may be proceeded with, according to Dr. Monckhoven's plan, with bichloride of mercury and cyanide of silver modified in this manner. The bichloride of mercury solution should be a cold, saturated solution at a temperature of 60° ; to one ounce of this add twenty grains of bromide of potassium. Let the negative, now very ghostlike, remain in this until it is quite whitened throughout ; remove and well wash, and then place it in the cyanide of silver solution, of double the usual strength, until the white image is replaced by a black one. Wash well, and the process is completed. If it is found insufficiently intensified, this process may be repeated, washing and drying between the repetitions. You will see there is nothing new in the use of either Mr. Howard Farmer's reducing or Monckhoven's intensifying plans ; the novelty rests in the application of them.

There are, undoubtedly, thousands of negatives thrown aside as useless on account of over-exposure, that will afford the useful and pleasant occupation of metamorphosing into good ones during the long evenings of the coming winter—it being essentially a process suited for artificial light—and the pleasure of seeing a negative given up as hopeless bloom into one without reproach may fairly divide the honours with making transparencies for microscopes or lantern slides, which are about the only photographic operations the majority of photographers can satisfactorily pursue during the gloomy winter season.

THE GALLIC ACID AND SILVER NITRATE INTENSIFIER—HYDROCHINON AS AN INTENSIFIER.

BY JOHN G. CASSEBAUM.*

The best method of obtaining the proper density in a gelatine negative is undoubtedly proper exposure and development. But even the best manipulators will sometimes be deceived in the printing qualities of a negative, and I believe most all who have used the wet plate process have often longed for some intensifier like the old iron and silver, or pyro and silver, and no doubt many have tried to intensify gelatine negatives by the same method, but encountered the disagreeable foe, red stain, and abandoned its use.

Now I feel convinced, from a number of experiments made, that iron, pyro, or gallic acid and silver can be used without any danger of staining if the film is thoroughly washed and rendered slightly acid before attempting intensification. If the plate is bathed in the iron and acid, pyro and acid, or gallic acid and acid solution for a few minutes, and the solution then poured back into the graduate, and the silver added and flowed back over the film, there will be very little danger of staining.

Nitric, acetic, or citric acid can be used with either of the above reducing agents. By this method a negative can be strengthened before fixing as well as after. In the first case the plate should be well freed from the developing solution, in the latter case thoroughly washed to remove all traces of hypo.

To intensify a negative before fixing can only be necessary when handling plates extremely poor in silver, as otherwise the desirable strength can be obtained in the development.

Now to come to the gallic acid and silver intensifying process published by Mr. Bartlett and Dr. Wallace, I must say that after many experiments in this direction, I have adopted the same, as it has proved the best of all in my hands. By using the preliminary bath of

Per-chloride of iron	4 grains
Chrome-alum	2 ,,
Citric acid	4 ,,
Water	1 ounce

we have at once a clearer, an acidifier, and a destroyer of the last traces of hypo.

The perchloride of iron (Mr. Bartlett's suggestion) has been added mainly for the last object, and also to improve the resulting colour of the negative. In ordinary temperature double the amount of citric acid can be used, and the alum dispensed with. In extreme warm weather, and when dealing with plates inclined to frill or soften, it is best to pass them through an alum bath, and to dry them before subjection to this process.

Attention should be paid not to carry the intensification too far, as the negative will gain intensity on drying. The negative should not remain too long in the preliminary bath, so as to allow it to bleach, unless handling a negative slightly fogged or over-developed ; in this case it is advisable to permit the plate to slightly bleach. The dish containing the solution should be gently rocked to prevent a net marking, which otherwise is apt to occur.

After taking the negative out of this bath, it should be well washed for several minutes under the tap, and the gallic acid and silver, as per formula, flowed over it :

A.—Gallic acid	80 grains
Alcohol	1 ounce
B.—Silver	40 grains
Water	1 ounce

One drachm of each to 2 or 3 ounces of water. When the negative has been allowed to bleach, intensification will have to be carried further, as the underlying image has been converted into a chloride of silver, and consequently would dissolve in the subsequent hypo solution. By carrying the intensification just to the right point, the negative, after leaving the hypo, will prove free of fog, and have brilliant lights and clear shadows.

Sometimes it will prove advantageous to flow the negative, when taken out of the fixing bath, with the clearing solution. It is needless to say that the plates should be well washed.

Recently I have made a few experiments with hydrochinon in place of gallic acid :

Hydrochinon	60 grains
Nitric acid	2 drops
Water	6 ounces

Half an ounce of this diluted with 2 ounces of water, and 1 dr. of silver solution added. Plate also previously acidified.

The action of this intensifier is somewhat slower, but the resulting colour of the negative is a rich black in the opaque parts, and even a plate pyro stained to the colour of a lemon was converted into one of a rich grey after subjection to this intensifier.

I believe hydrochinon and silver will prove an excellent intensifier and toner for window transparencies.

Review.

Das A B C der modernen Photographie. Von W. K. Burton. Deutsch von Herm. Schnauss, 3te vermehrte Auflage.

"Burton's A B C of Photography is too well known as a good hand-book for the beginner for any praise from us to be needful, and we may remark that the editor of the third German edition has done his work extremely well.

⁂ *One Review this week takes the form of a leading article (see page* 673).

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* Read before the Photographic Society of Philadelphia.

Patent Intelligence.

Applications for Letters Patent.

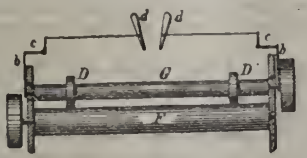
14,112. William Alfred Morrison Brown, 15, Guildford Street, Leeds, for "An improvement in the means or apparatus for washing photographic negatives and prints."—Oct. 18th, 1887.

14,171. James Henry Steward, 406, Strand, London, for "Magic lantern slide stages and carriers."—Oct. 19th, 1887.

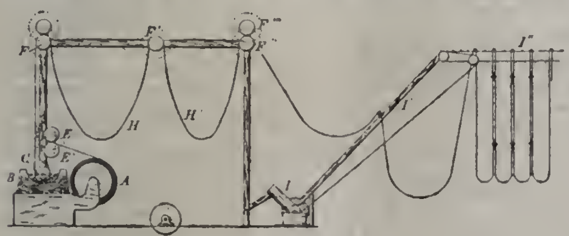
Patents Granted in America.

370,050. George Eastman, Rochester, N.Y., assignor to the Eastman Dry Plate and Film Company, same place, for "Apparatus for coating photographic paper."—Filed Jan. 13, 1887. Serial No. 224,189. (No model.)

Claim.—1. In a machine such as described, the combination, with the trough containing the emulsion, the immersion-roller, and the rollers for conducting the paper to the immersion-roller, of a driven roll over whic the coated web is conducted, a moving surface applied to the edges of the web of coated paper and the face side thereof, and operating to press and hold the web in contact with the said roll, driven rolls upon which the paper is supported and kept in motion while the coating is setting, and a hanging or drying frame upon which the web is delivered and retained until dried, substantially as described.



2. In a machine such as described, and in combination with the trough containing fluid emulsion, the immersion-roll for conducting the web of paper through the emulsion, a pair of rolls, the one cylindrical and the other collared, the paper web passing over and resting with its uncoated face upon the cylindrical roll while the collars bear upon the opposite face of the paper, one or more driven supporting-rolls over which the coated web of paper is suspended, and at the same time kept in motion, a driven delivery-roll, and a hang up or drying-frame on to which the coated web is delivered after the emulsion is set, substantially as described.

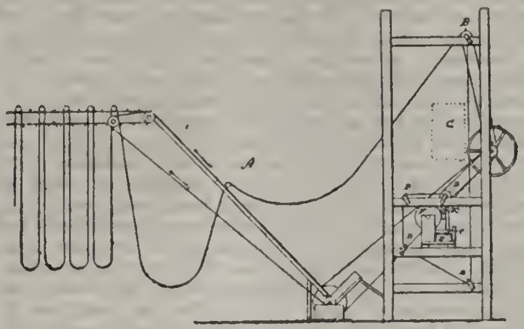


3. In a machine such as described, and in combination with the coating devices for applying liquid sensitised emulsion to one face of a web of paper as it is drawn, continuously operating feeding devices located intermediate the hang up and coating devices, said feeding mechanism operating to grasp the web of paper at the edges and draw it forward over a smooth supporting-surface moving in the same direction as the coated web, substantially as described.

4. As a means for retaining the paper flat and the coated surfaces separated while on the drying frame, the combination therewith of clips applied to the edges of contiguous folds, substantially as described.

370,110. William H. Walker and George Eastman, Rochester, N.Y., assignors to the Eastman Dry Plate and Film Company, same place, for "Process of coating photographic paper."—Original application filed October 25, 1884, Serial No. 146,449. Divided and this application filed, March 5, 1887. Serial No. 229,847. (No model.)

Claim.—1. The herein-described method of producing uniform coatings upon continuous webs or strips of fabric, which consists in applying the coating material in a fluid condition evenly upon the face of the web and in changing the flow of the coating upon the web to regulate and maintain its uniformity, and maintaining the web in motion, and its coated surface unobstructed by contact with foreign bodies, until the coating has set or hardened sufficiently to prevent running, substantially as described.



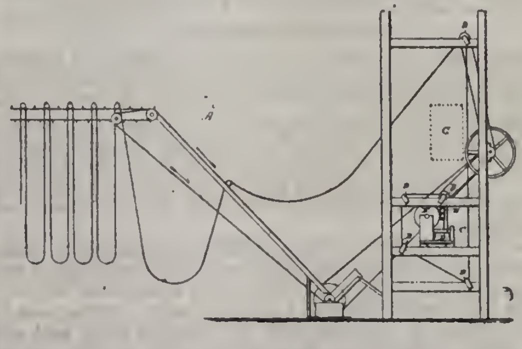
2. The herein-described improvement in the art of producing photographic paper, which consists in applying to one face of a web of paper a thin uniform coating or surface of fluid gelatino-argentic emulsion by causing the paper to emerge from the level surface of a body of emulsion, and subsequently maintaining the coated web flat and in motion continuously and uniformly in the same direction, and the surface of the coating undisturbed by contact with foreign substances, until the gelatine has set or stiffened sufficiently to prevent running, substantially as and for the purpose set forth.

3. The herein-described process of producing gelatino-argentic fabric for photographic reproductions, consisting in applying to a moving continuous web of fabric a uniform layer of sensitive gelatino-argentic emulsion, keeping said web in motion, and the coated side unobstructed until the coated gelatine is set or stiffened sufficiently to prevent flowing, and finally drying said coating.

4. The herein-described method of producing uniform coatings upon continuous webs or strips of fabric, which consists in applying the coating material in a fluid condition evenly upon the face of the web, and subsequently maintaining the web in motion, and its coated surface unobstructed by contact with foreign bodies until the coating has set or hardened sufficiently to prevent running, substantially as described.

370,111. William H. Walker and George Eastman, Rochester, N.Y., for "Process of coating photographic paper."—Original application filed March 5, 1887. Serial No. 229,847. Divided and this application filed August 20, 1887. Serial No. 247,492. (No model).

Claim.—1. The herein-described process of coating a continuous web of fabric with a uniform layer of sensitive gelatino-argentic emulsion, consisting in applying the emulsion to one side of the web as it is passed through the coating device, in artificially cooling the coated web, in keeping the coated web in continuous motion, and the coated surface removed from contact with obstructing devices until it is set, and finally, in delivering the web to a suitable rack or frame to dry, substantially as described.



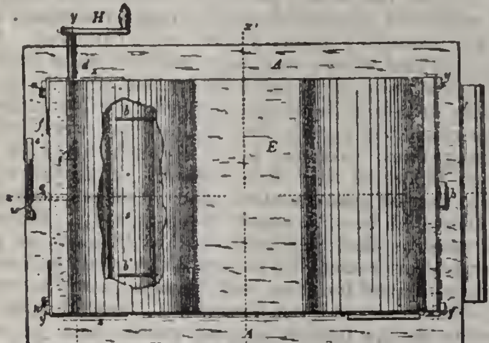
2. The herein-described process of coating a continuous web of paper with a uniform layer of sensitive gelatino-argentic emulsion, consisting in applying the emulsion to the lower side of the web as it is passed through the coating device, in carrying the coated web on suitable moving supports around the coating apparatus, and keeping it continuously in motion, and the coated surface unobstructed until the gelatine has set or stiffened sufficiently to prevent flowing, and in subsequently delivering the coated web to a suitable drying frame or rack, substantially as and for the purpose set forth.

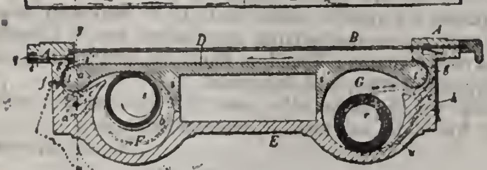
3. The herein-described continuous process of producing gelatino-argentic fabric for photographic reproductions, consisting in applying in a suitable non-actinic light to a moving continuous web of fabric, a uniform layer of sensitive argentic fluid emulsion, keeping said web in motion, and the coated side unobstructed, until the coated gelatine is set or stiffened sufficiently to prevent flowing, and, finally, while the web is in motion, and the coating being applied, depositing that part of the web on which the coating has set or stiffened at rest with relation to its supports to dry.

370,216. Isaac H. Stoddard. New Haven Conn., assignor to the Eastman Dry Plate and Film Company, Rochester, N.Y. "Photographic web-holder."—Filed April 26, 1886. Serial No. 200,131. (No model.)

Claim.—1. In combination with a photographic web-holder, friction-rollers adapted to feed the web by contact with its edges, substantially as and for the purposes set forth.

2. In combination with a photographic web-holder, friction-rollers adapted to feed the web by contact with its edges, and a suitable brake or frictional device applied to the web, substantially as and for the purposes set forth.





3. In combination with a photographic web-holder, the feeding, a' a''' and web-support D, substantially as described.

4. In a photographic web-holder provided with the receptacles F and G, the web-support D and friction-rollers a'' a''', substantially as described.

5. The combination, in a web-holder, of the web-feeding rollers a a' a'' a''' and web-support D, substantially as described.

6. The combination with a photographic web-holder, of the feeding-rollers a'' a''', shaft d, and crank H, substantially as described.

7. The combination, with a photographic web-holder provided with the receptacles F and G, of the web-support D, friction-rollers for feeding the web, and resistance-rollers c c', substantially as described.

8. In a photographic web-holder, the web-feeding rollers applied to the edges of the web, and a suitable guide or guides operating to form the exposed webb into a roll, substantially as described.

9. In a photographic web-holder, a web-receiving receptable provided with a curved guide adapted to form the exposed web into a roll, substantially as described.

10. The combination, with a photographic web-holder provided with the receptacles F and G for the exposed and unexposed web, of the web-support D, suitable friction-rollers for feeding the web, and means, substantially as described, for effecting the coiling of the exposed web within one of the receptacles.

11. The combination, in a photographic web-holder, of the receptacles F and G for exposed and unexposed web, web-support D, friction-rollers for feeding the web, and frictional device to maintain the web in a state of tension, and suitable means for coiling the exposed web within one of the receptacles, substantially as described.

12. The combination, with the receptacles F and G for exposed and unexposed film, of the web-support D, having rounded-ends t t', and the curved or tortuous passages leading to said film-receptacles, substantially as described.

13. The combination, in a photographic web-holder, of the receptacles F and G for exposed and unexposed web, web-support D, and projecting lip e, substantially as described.

14. The combination, in a photographic web-holder, of the receptacles F and G for exposed and unexposed web, web support D, and one or more coiled springs, b, adapted to act as guides to effect the coiling of the exposed web within one of the receptacles.

15. The combination of the receptacles F and G, web-support D, lip e, and one or more curved elastic guides, b, substantially as described.

16. In a photographic web-holder, friction-rollers applied to the edges of the web to feed the same, and suitable means for adjusting the pressure of the rollers on the web, substantially as described.

17. The combination, with a photographic web-holder, of the friction-rollers a a' a'' a''', shaft d, and crank H, arranged to operate as an indicator of the length of the web for one exposure, substantially as described.

18. The combination, with a photographic web-holder, of the friction-rollers a' a'', arms r' r'', and adjusting-screws n n' substantially as described.

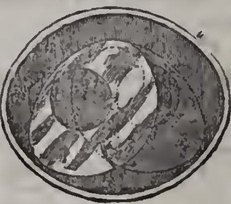
19. The combination, with the front A, provided with the exposing shutter B, of the casing C, carrying web-support D, back E, receptables F and G, and friction-rollers applied to the edge of the web and adapted to be revolved to shift the web, substantially as described.

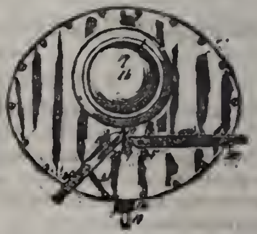
20. In a photographic web-holder, in combination with suitable mechanism for feeding the sensitized web, a device for coiling the exposed web as it comes from the feeding mechanism, and guards for holding the edges of the sensitized web against the web-support, substantially as described.

21. In a photographic web-holder, the combination of the guards for holding the edges of the sensitized web against the web-support, and a suitable friction device for feeding the web, and a brake or frictional-resistance device operating to maintain the web in a state of tension, substantially as described.

370,673. Robert E. M. Bain, St. Louis, Mo., assignor of one-half to Edward W. Pike, same place, for "Shutter for photographic cameras."—Filed July 20, 1887. Serial No. 244,829. (No model.)

Claim.—1. The combination, with the shutters 3 and the pin 9, engaging in pin-holes 8, and working in guide-slots 10, of the spring catch 19, sustaining the pin in its elevated position, substantially as set forth.





2. The combination, with the shutters 3, and a pin 9, engaging the pinholes 8, and working in guide-slots 10, of the catch 24, arresting the shutters at half-stroke, substantially as set forth.

3. The combination of shutters 3, formed with apertures 7, wings 17, 18, and pin-holes 8, and turning on pivots 5, air-cylinder 11, piston 12, worked by means of a compression-bulb,

15, the pin 9 engaging in the pin-holes 8 of the shutters, and working in the guide-slots 10 of the case, and the spring-catch 19, substantially as and for the purpose set forth.

4. The combination of the shutters 3, formed with apertures 7, wings 17 and 18, and pin-holes 8, pin 9, engaging in pin-holes 8, and working in slot 10, an air-cylinder 11, piston 12, to which the pin 9 is attached, a compression-bulb in communication with the interior of the cylinder, and a stop 24, arresting the shutters at half-stroke, substantially as and for the purpose set forth.

Correspondence.

WHAT IS AN AMATEUR?

THE YACHT PHOTOGRAPHS.

Sir,—In Mr. West's letter in the issue of 21st October, he speaks of an amateur with a large camera (why did he not say a "small cottage"?). He also says that the said amateur was the first person to photograph the *Thistle*. Why did he not say Mr. W. H. Hyslop? There are a few mistakes in Mr. West's letter which I should like to correct; and a few questions which I should like to answer.

First, he says that amateurs like something more than a camera that requires four men to handle. I think that any amateur would be most happy to use a camera that required twenty men to handle if his purse was long enough, more especially if Mr. West challenged them to take the medal at any exhibition from him. Again, the *Volunteer* was commenced to be built before the *Thistle* was launched, therefore Mr. Hyslop's photos of the *Thistle* under sail could not have been taken before that. Mr. West again is wrong in saying that those photos of Mr. Hyslop were on view in America and not in England, as they might have been seen to the same extent in both countries, and in the same place, viz., the saloon of the *Thistle*.

Mr. West does not seem to understand the feelings of a yachtsman photographer. An amateur as a yachtsman goes to every regatta he can get to, and as a photographer his camera is his constant companion, he takes it also. As to asking for an offer, surely Mr. West must remember offering to give Mr. Hyslop a few prints for his large negatives; this happened just at the close of the conversation Mr. West quotes in his letter. As an amateur, I should like to give Mr. West a little information, that is, to use a single lens rather more than twice the base of the plate focus, and not to stay on the flag boat, but to have shots at the start, if he wants to have the first photos of a race.—I am, &c., H. J. Gifford.

Dear Sir,—Referring to Mr. A. J. West's letter in your issue of 21st inst., I would ask to be allowed to reserve my reply till next week, as the grave insinuation made against my conduct necessitated the matter being placed in the hands of my solicitor.—Yours faithfully,

Wm. H. Hyslop.

Hazlerigge, Coolhurst-road, Crouch End, N., Oct. 26th.

TAKING UP A CAP.

Dear Sir,—My attention has been called to a paragraph in "Notes" of Photographic News, Oct 14th, which is both misleading and untrue. I take it upon myself to be the Professional alluded to, and should wish to point out how wrong the accusation is. The lens was bought after a conversation between Mr. Dallmeyer and myself as to what would be the most suitable for my work, and not due to what I saw in the Photographic News afterwards. Instead of misleading the amateur spoken of, I gave him all the information in my power, and was pleased to do so. With reference to my viewing his work uneasily, this I emphatically deny. Why should I, if he was an amateur? His pictures would not affect my business. At least this has been my opinion until lately, but now, finding this amateur is really as much a professional as myself, I certainly do feel a little uneasy, as I let him into certain secrets which were my own invention as to the best way of photographing seascapes. He has evidently made good use of my information, but I hardly think it generous to be accused in the manner spoken of in your paper.—Yours truly, A. J. West.

[The paragraph which our correspondent is pleased to regard as referring to himself, is the following:—"A well known professional who has distinguished himself in marine photography availed himself of a hint we gave some time ago, and obtained one of Dallmeyer's new single rapid lenses for his seascapes. Soon after, an amateur acquaintance—whose exceptional work he had just begun to view uneasily—came around and noticed the new lens. The professional would not communicate that which he had learned from the News, and endeavoured to mislead the amateur as to the instrument, but the latter gathered that it was one of Dallmeyer's. Sauntering away with his hands in his pockets he went to the telegraph office, and wired for 'Similar lens to that recently supplied to ———, but for 24 by 18 plates.'"]

ARE PLATE MAKERS RESPONSIBLE FOR BAD PLATES?

Sir,—Referring to Mr. Palmer's letter in your last issue, I think he need not be in any doubt as to his power to bring the makers of the plates he describes to book, unless it be that they carry on business abroad, in which case the law may differ from that which prevails here.

By English law, where goods are ordered and supplied for a particular purpose, there is an implied warranty that they are reasonably fit and proper for that purpose. It is quite clear that when a man buys sensitive plates it is for the purpose of taking pictures upon them, and if, in the ordinary process of development, the films frill completely off the glass, it is equally clear, unless they were sold as stripping films, that the plates are not fitted for the purpose for which they were ordered. Moreover, a contract to furnish manufactured goods implies a warranty that they shall be of a merchantable quality. Hence in such cases as that mentioned by Mr. Palmer, the purchaser has his remedy by returning the goods and suing for the price paid for them, and damages, if any incurred. But in most cases it is not necessary to depend upon the warranty the law implies, as many makers send out with the plates a formula which contains a laudatory description such as—to quote from one before me—"Characteristics of the plates: Freedom from fog and frilling, durability, uniformity, and cheapness, &c."

This would materially assist the purchaser in making good his claim.—I am, sir, yours obediently,

W. A. Greene.

Sir,—If "Belgian plates" are really made abroad, and are not merely an English make with that name, who is more to blame than Mr. Palmer, for buying them? We have in this country splendid plates, none of them heavily priced, some of them very low indeed. In this year, I have used Marion's "Britannia," and "Soho," Thomas's, Paget's, Fry's, Edwards's, and can say of them, they are superb. Besides these, are plenty other makers of equal repute. Why, then, seek a foreign brand, and complain of platemakers generally?

If ever a great need was handsomely met, there is an example in the English platemakers by the supply they offer us. I have just sent, for competitive exhibition, two 20 by 16 figure studies taken a month since, on plates I bought five years ago, from one of the makers I have named. They had no fancy frill developer, and required no alum to correct it. Although I am sure alum is most useful, frill or no frill, I rarely need and as rarely use it.

Mr. Palmer's ten pounds will be better applied to the purchase of a good brand of English-made plates, than to an object so questionable of good results as that he offers it for. WILLIAM ADCOCK.

Melton Mowbray, October 24th, 1887.

THE EXHIBITION AT PALL MALL.

DEAR SIR,—As you have published Mr. F. H. Evans' long letter in your last issue without any comment of your own, perhaps you will allow me to say a few words about the "superficial criticism" he so bitterly complains of.

If, as I suppose, the photo-micrographs now exhibited by Mr. Evans are the same as some of those he showed last year at the Royal Microscopical Society, and soon after at a meeting of the Quekett Microscopical Club, he should have been satisfied with the "very high praise accorded" to him then, and certainly ought not to complain of anything after receiving a medal from the Photographic Society this year, as, in that case, his photos, by having been exhibited in London before, should not have been even hung in the present exhibition at all, according to the P. S,'s own rules.

I must also endorse your remark, that Mr. Evans' exhibits are "good common-place photographs of everyday subjects, &c.," and such, I think, as any experienced photo-micrographer should find no difficulty in producing, with the present perfection of our instruments.

Mr. Andrew Pringle's beautiful productions, on the other hand, represent work which only a few can attempt, and, both from a microscopical and a photographic point of view, they richly deserve the medal awarded to them. Whether they are better than Dr. Crookshank's or not has nothing to do with the case. They certainly "belong to a much more difficult class of work" than those of Mr. Evans.

In fairness to Mr. Evans, however, I must contradict the *Times* by saying that his work undoubtedly *is* "above the average of such productions," and that it also shows definite progress, as most of the so-called photos of microscopic objects we have been accustomed to see are nothing but more or less sharp silhouettes on a glaring background.

This makes me regret all the more that a worker of Mr. Evans' evident ability should take photo-micrography in such an unscientific spirit. His saying that Mr. Pringle's photos charmed him "most as specimens of exquisite *decorative designs*" shows this. Neither is it scientific to try to run down the whole science of bacteriology with M. Pasteur at its head, in an ineffectual attempt to eclipse Mr. Pringle's success!

In conclusion I may state, that not knowing personally either Mr. Pringle or Mr. Evans, the only interest I have in writing this is my desire to see fair-play and earnest work in that charming branch of science, photo-micrography, and I hope that for the same reason you will excuse my taking up so much of your valuable space.—Yours faithfully, J. GUARDIA, F.R.M.S.

Ilelston House, Rozel Road, Clapham, S.W.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

ON Monday evening, the 24th inst., members of the Amateur Field Club exhibited slides in the lantern at the Exhibition Gallery, 5A, Pall Mall East. Those shown by Major T. M. Brownrigg (President), Seymour Conway, and G. Davison received frequent applause from a large and appreciative audience. Schanchieff's electric battery, in conjunction with an arc lamp supplied by Woodhouse and Rawson, was used for illuminating; the disc was not large, but upon the whole fairly well illuminated; still the light was not very steady.

On Tuesday evening, the 25th inst., the adjourned special general meeting to consider the proposed alterations in the present laws of the Society was held in the Exhibition Gallery, JAMES GLAISHER (President) in the chair. The remaining paragraphs 24 to 39 inclusive were dealt with, details of which will appear in a report of the discussion in our next issue. The special general meeting was adjourned until 7 p.m. on Tuesday, the 15th prox.

The meeting then became technical, T. SEBASTIAN DAVIS in the chair, when apparatus now in the exhibition was shown by exhibitors, and the various points of novelty explained.

T. SAMUELS fully described his patent "Aurora Camera" with indicator and lever action focusser (catalogue number 638), also exhibits 639 and 640.

W. H. WALKER detailed the advantages of lightness, portability, and certainty combined in the Eastman new model "Roll-holder," Nos. 641 and 642.

J. R. GOTZ pointed out the improvements contained in his patent camera, No. 643. He also showed the rapid action obtainable with the "Volute" shutter, No. 644.

T. J. COLLINS brought under notice the improvements included in his portable camera, 645; adjustable bamboo tripod stand, 646; cyclists' stand, 647; and his new detective camera, 648.

W. TYLAR's exhibit, a double band shutter similar to that shown by Lieut. Wight last year, was explained.

ARUNDEL and MARSHALL's plate box (medal), No. 654, was next shown, and elicited a short discussion, in which J. Traill Taylor enquired whether it was not customary to use metal grooves in all, or nearly all plate boxes.

S. G. B. WOLLASTON and A. MACKIE had used boxes similarly made for a long time, and failed, as did other speakers, to distinguish any point of novelty about the boxes which had received an award.

The CHAIRMAN, many years ago, employed metal plate boxes, but the claim of merit he believed was the lightness of construction, and the metal runs being faced with paper. He used to find paper harbour dust, get torn, and sometimes check the free passage of a plate into its groove.

The CHAIRMAN having intimated that a description of other exhibits be deferred until the next technical meeting,

Major-General PESTON remarked that an adjournment was undesirable, and would be extremely unfair to country members; however much time might be devoted to an examination of apparatus on the tables during ordinary hours of exhibition, a description by exhibitors such as they had just listened to was more highly appreciated. He complained that the Council, in calling a special general meeting earlier in the evening, had acted unwisely, for the whole evening should have been devoted to the technical business, and not wasted upon a disscusion of rules.

These remarks having met with approval, the Chairman decided to continue the technical business.

E. J. LEZARD gave some particulars regarding the exhibits of Lezard and Co., No. 695, "Photochronoscopes" (see page 674).

In reply to a question from the Hon. Sec., Mr. Lezard stated that the ordinary stop-watch movements were in no respect identical with the instruments shown, some of which latter enabled two exposures of different durations, &c., to be timed most accurately at one operation, besides other advantages.

W. WATSON and SONS showed a detective camera, No. 663, and their "Premier," No. 664. A noticeable feature in this latter was the patent spring catch for securing the dark shutter, which does not necessitate cutting a recess in the already light and slender wood work. When the shutter is driven home a crescent shaped plate or collar passes under a metal head; in gripping the shutter to withdraw, a spring is forced back, which releases the collar, and the shutter is then pulled out. The spring clip can be applied to any slide.

The next ordinary meeting will be held in the Gallery on Tuesday, November 8th, when the distribution of medals will take place.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING was held on the 20th inst., A. HADDON in the chair.

The Welsbach incandescent gas burner was shown by W. Winter, and Mr. Fisher explained the points of novelty about it. A Bunsen flame is used, which heats to incandescence a suitably prepared mantel supported in the body of the flame. This ensures a more perfect combustion of gas and atmospheric air, and a light of great brilliancy is emitted. The mode of preparing the mantel was briefly alluded to, and upon variations in this process depends the colour of the resulting light. Zirconium, lanthanum, yttrium, and other alkaline earths are used separately, or mixed in various proportions to obtain the desired colour. Among the advantages claimed is economy of gas to the extent of fifty per cent.; a small burner consuming two and a half feet per hour gave a light said to be equal to twenty candles. It closely resembles the electric light and radiates very little more heat.

Some sensitometer experiments were made by Messrs. A. Cowan and A. L. Henderson with the Welsbach lamp and a No. 5. Bray burner, the result showing nearly double the photographic effect in favour of the Welsbach burner. The plates used registered 22° Warnerke, the exposure under the tablet being sixty seconds at a distance of 8 feet. A portrait was also taken with an exposure of one minute, but the time was less than one-fourth long enough to bring out full detail.

H. Spinks drew attention to a shutter constructed to regulate the duration of exposures.

North London Photographic Society.

At the meeting held on October 18th, at Myddelton Hall, J. Traill Taylor in the chair, F. Dunsterville and E. W. Parfitt were elected members of the Society.

A. Mackie gave a demonstration of the method of preparing and developing collodio-bromide emulsion plates. He said the glass plates, after having been thoroughly cleaned, required some treatment to prevent the film slipping. A coating of thin india-rubber solution, or even an edging of the same, was effective, as was also a dusting of French chalk well polished off; but the method he recommended was a modification of that published by J. B. B. Wellington. It consisted simply in immersing the cleaned plates in a very hot solution of gelatine containing about twenty grains to the pint, and drying with a clean cloth. The plates were coated with the emulsion by pouring it on exactly as in the wet-plate process, the plates were coated with collodion; but he advised that the surplus should not be returned to the stock, but should be received into a separate bottle, as by this plan spots in the plates due to dust were in a great measure avoided. The exposure for contact printing would be about twenty to forty seconds when a gas flame was used, but he preferred to use magnesium ribbon, a half-inch to one inch of which burned a foot from the negative would be found sufficient. The development was preferably by alkaline pyro, and either liquid ammonia or the carbonate of ammonia, potash, or soda, might be employed, the proportion being suitably adjusted. The following formulæ would all be found to work well :—

Liquid ammonia ... 2 minims
or,
Carbonate of ammonia 16 grains
or,
Carbonate of potash ... 24 „
or,
Carbonate of soda ... 40 „

} With 8 grains of pyro, 4 grains of bromide of ammonium, and with sulphite of soda, if preferred, to the ounce of developer.

The colour of the image was somewhat dependent upon the alkali employed, but to a greater extent was controlled by the amount of exposure, a full exposure being necessary to obtain a warm tone, and with a thin negative it was advisable to increase the pyro. Before development the plate should be flooded with methylated spirit, and then washed until water would flow over its surface without streaky lines. A dish might be used for the development, but was not necessary, and the plate might be developed in the hand in the same manner as a wet plate. Speaking of the advantages of collodion over gelatine for transparencies, Mr. Mackie referred to the absence of any requirement for special apparatus for drying the plates, which would dry spontaneously in a few hours in an ordinary wood grooved plate box. By applying heat, however, the drying need not take more than a few minutes, and he claimed that it was quite possible to prepare a plate, expose, develop, fix, wash, dry, and bind it, so as to make a complete lantern slide, in a quarter of an hour. The whole of the operations were successfully performed at the table, and the resulting slide afterwards passed through the lantern.

J. Nesbitt then described the apparatus he used for reducing to lantern size from larger negatives, which was so arranged that the negative might be shifted so as to bring any part of it opposite the lens. The illumination was obtained by pointing the apparatus to the sky, but a reflector at an angle of forty-five degrees might also be used. In reply to a question, Mr. Nesbit said that no light except that passing through the negative should be allowed to reach the lens.

The next meeting (the annual general) will be on November 1.

North Surrey Photographic Society.

The usual fortnightly meeting was held at the "Greyhound" Hotel, Dulwich, on October 19th. Mr. Gates in the chair.

W. H. Baldwin and Dr. Williams were elected members.

J. Thompson, F.R.G.S., gave a lecture on "The Use and Abuse of Photographic Lenses." Beginning with a general survey of the origin of lenses, the lecturer described the properties of their various forms, from the pinhole to the most recent patterns. When treating of wide angle lenses he pointed out where this form could be used without destroying pictorial effect in the resulting picture. He showed how the topographical value of pictures, especially of new countries, was entirely destroyed by the use of a lens of an angle widely differing from the human eye, and concluded by treating of the best form of lens for enlarging purposes.

At the next meeting on Nov. 2nd a paper will be read by Herbert Starnes on "The Permanence of Different Varieties of Photographic Prints."

Bury Photographic and Arts Club.

The annual meeting was held on October 19, at the Temperance Hall, F. W. Livsey in the chair. There was a large attendance, which impressed upon the council the necessity of providing larger rooms.

The following gentlemen were then elected as officers for the ensuing year :—

Pres.—F. Cooper. *V.-Pres.*—W. S. Barlow and E. W. Mellor.

Council—H. M. Dearden, R. Grundy, junr., C. H. Openshaw, A. Taylor, W. Booths.

Hon. Sec.—F. W. Livsey. *Assist. Hon. Sec.*—R. Grundy, sen.

Treas.—R. Grundy, sen. *Auditors*—J. Newbold and R. Wood.

The members resolved to hold an exhibition and soirée in the early spring.

Bristol Camera Society.

The first meeting for the winter season was held at the University College on the 13th. inst., Dr. Arthur Richardson in the chair. J. H. Brock, Rev. H. C. Coote, J. Cartlidge, Dr. D. S. Davies, A. Keitch, P. Lewis, J. W. Munro, R. C. Thourk, and H. I. Rudge, were elected members.

The Chairman, in the course of remarks on the aims of a photographic Society, observed that he would like to direct attention to orthochromatic processes, which, when perfected, he considered would be a step in the right direction, inasmuch as it would give better proportion to various colours, and give a more correct idea of the relative intensities. He would also like to know if any member present had tried the experiment of exposing a piece of plain glass in the camera to an object, and developing the image by means of breathing on same, as in the case of exposed carbon tissue.

A large number of prints, the result of summer's work, were passed round for inspection and criticism, and much useful information was elicited.

Photographic Society of Philadelphia.

A meeting of the Society was held October 5th, with Vice-President John G. Bullock in the chair.

John G. Cassebaum, who was present by invitation, read a paper on "Gallic Acid and Silver Intensifier as applied to Gelatine Plates" (see page 682). The paper was listened to with great interest, after which specimen plates intensified in this manner were shown, and the process demonstrated by actual experiment.

Vice-President Bullock and other members who had tried the method spoke highly in its favour.

Mr. Carbutt showed a number of prints made from over-exposed plates originally so thin that mercurial intensification had failed to produce printing density. A further application of gallic acid and silver resulted in great increase of density, and excellent prints were thus obtained.

Dr. J. M. Jordan showed one of Cooper's enlarging lanterns, and illustrated its use by making some enlargements with Anthony's bromide paper. The light (which is supplied by a kerosene lamp fitted with a "Duplex" burner) passes through two condensing lenses, and thence through the negative. By means of a small portrait lens the image is projected against any perpendicular surface to which a piece of bromide paper may be attached. By means of the lantern shown, cabinet sized negatives could be enlarged life-size or over. A valuable feature of the apparatus was that by detaching the lamp, the camera portion could be adjusted in a window so as to use daylight as a source of illumination. When so arranged, negatives as large as 8 by 10 could be enlarged from. The camera could be used for copying purposes, having extra long bellows, and by further changes in the adjustment an excellent optical lantern was produced. The paper used by Dr. Jordan was much more rapid than most brands of bromide paper, and it was claimed that equally good results could be obtained from negatives which varied greatly in density.

Mr. Wood stated that he had lately examined some film negatives made about a year ago, and had found them covered with mould.

Mr. Walmsley thought the trouble was caused by neglect to coat the films on both sides with thin collodiom. This would keep out the moisture—which probably caused the mould—and was now recommended by the makers.

Mr. Bullock called attention to the defect which he had frequently noticed of late in plates of several different brands. Minute particles of chrome alum seemed to be present in the film, producing dark spots in the negative, sometimes partially redissolving in the washing, and causing a comet-like streak on the plate. He suggested that they were caused either by careless filtration or perhaps crystallization of the alum in the emulsion.

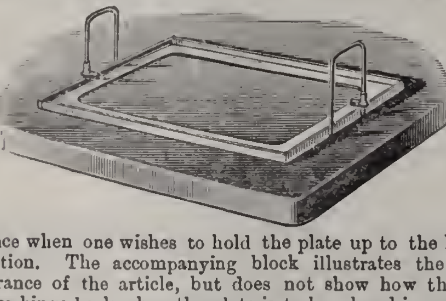
Mr. Carbutt thought the quantity used was too small for the latter suggestion to hold good.

Dr. Wallace called attention to an article in a recent German journal, which gave some new details of the Obernetter process for transforming a transparent positive into a negative. The positive must be greatly over-timed, and over-developed in ferrous-oxalate. After washing, a weak solution of chromic acid is applied, which is in turn washed off, and a solution of ammonia applied, the sensitiveness to light being thereby restored. The plate is then exposed to white light for a few seconds, and re-immersed in the ferrous oxalate. The negative image now slowly appears, and, when sufficiently strong, the plate is fixed as usual. To succeed with this curious process, the plates must be coated with an emulsion that contains but little gelatine (gelatinearm), and some practice is necessary before perfect results can be expected. The great over-exposure, and thorough development following, are mentioned as important points.

W. D. H. Wilson showed one of Gray's new model vest cameras, made for taking four pictures on a plate, each $2\frac{5}{16}$ in diameter, a convenient size for making lantern slides by contact. The camera was provided with a circular case in which it could be carried and used as an ordinary detective camera, its shape and appearance being such as to attract but little attention.

Talk in the Studio.

Tylar's Plate-Lifting Frame.—We have received one of the above for review, and we are very pleased with its performance. It consists of a light frame of electro-plated metal, provided with two staple-shaped handles. But the best feature consists in the fact that a rubber coated stud is attached to each handle in such a way as to retain the plate firmly in the frame, a great convenience when one wishes to hold the plate up to the light for inspection. The accompanying block illustrates the general appearance of the article, but does not show how the lifting handles hinge back when the plate is to be placed in position or removed. We would suggest the same kind of arrangement for holding plates in an enlarging apparatus. The plated lifting frames are very low in price, half-a-dozen of quarter-plate size only costing half-a-crown.



R. W. Thomas and Co.—This well known photographic manufactory and supply business is shortly to be converted into a limited liability company, under the directorship of J. L. Lyell, F. York, H. K. Barraud, H. Manfield, W. F. Donkin, and A. E. Brooke-Hunt.

The Stereoscopic Company's Exhibition: more than Fifty Medals.—The Secretary informs us that two hundred and fifty persons have entered exhibits, so that the Photographers' Benevolent Association will be entitled to receive this number of entrance fees, in accordance with the promise made by the Company. We also have received the list of awards. It comprises five money prizes, fifty-four medals, and seventeen high commendations; making a total of seventy-six distinctions. Out of these ten are awarded to women. The date of opening will shortly be announced.

Photographic Club.—The meeting on Nov. 2nd will be the Annual General Meeting for election of officers, &c.

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

S. C.—We will post you some tickets, and also some particulars which will enable you to form an opinion as to which association it will be most convenient for you to join.

W. C. Crofts.—We have posted the letter. As regards the permit, there is no difficulty, as it will be at once given on application at an office which is in a street towards one's right hand as one stands in the Forum with face towards the Capitol. Any one of the sentries on duty will point it out to you. No permit is required for photographing in the streets.

Walter L. Nash.—It is a point which has generally been neglected by those who have written photographic books, but numerous articles have appeared in the Photographic News. See Debenham's on page 804 of the News for 1884 (Dec. 19); also Wilson's "Quarter Century of Photography," published at 16/-. You can order it through Trübner, of Ludgate Hill, or perhaps obtain it at once from Percy Lund and Co., Bradford.

W. M. Philips.—The plates referred to are not yet to hand.

A. J. C. D.—Thank you very much. We will carefully go into the matter, and let you know the result.

W. Strudwick.—High Street, Leicester, is sufficient address.

A Professional.—Authorize us to publish it with your name, and it shall be inserted next week.

Photo-Litho.—1. The two gelatines are so nearly the same, that one can hardly look here for the difficulty; but the slowness in drying will quite account for the difference. Try a little more general heat in the room—that is to say, warm the walls by keeping fires for some time previously. To merely warm the air by a fire at the time is not sufficient, as the heat is exhausted in drying off the accumulated moisture from the walls. A kitchen in which a large fire has been burning during the day generally makes an admirable drying room at night when the fire is out. 2. Yes; either at the back, or in a bichromate solution to which alcohol has been added; sufficient alcohol to prevent the albumen dissolving, but not enough to coagulate the albumen. If the paper is so even in texture as to allow the solution to permeate it equally, sensitizing at the back is to be preferred, as the alcoholic solution changes rather rapidly. We think you might venture on a temperature rather over that recommended by Husband.

Augustus Harvey.—The leaflet interests us much, and it is difficult to overrate the educational value of such organisations if they could be established on the basis you recommend.

R. B. Baker.—Thank you for the paper, which has been put in hand.

J. M. C.—A frame of dry pine wood soaked in paraffin wax, and a bottom formed of interlaced string also soaked in melted paraffin wax.

Aspirant.—Your gelatine is evidently of a kind giving a very thin solution. Diminish the quantity of water, or work at a lower temperature; perhaps it may be as well to do both.

A. Michael.—1. If you send to our publishers a letter addressed to "Panel," they will forward it. 2. It is very difficult to form an opinion as to the desirability of a business offered, and we have not ourselves that business experience which would enable us to confidently offer you advice as regards any particular case.

V. W.—We know nothing more than we can gather from the article referred to, but should we learn more we will write to you.

H. G. W.—It is the result of very long exposure, and is a recognised method of making reversed negatives. Expose very much longer—that is to say, until there is a visible image on the plate—and you will succeed. Oxalate is the best developer in such a case.

C. Lonsdale.—We will post your letter on to our contributor.

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THE PHOTOGRAPHIC NEWS.

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PRACTICE AND THEORY IN DEVELOPMENT.

The theorist is a useful individual, because he brings an extended and exact knowledge to focus upon the doubtful point; but the 'prentice hand, whose knowledge is small, and whose theories are far-reaching, is dangerous in proportion to the attention that he secures.

The unpretending theorist has often a self-satisfying consciousness of right, and shuns public discussions, where loud and witty speakers have so great an advantage. But the advice of a capable theorist is well worth seeking out, especially when the balance between two opposite practices leaves us in doubt as to which is really the best.

When gelatino-bromide plates were gaining the universal patronage that they now enjoy, Continental photographers considered that they were ahead of the English in mainly using ferrous oxalate as a developer. Pyrogallic acid, however, continued to hold its sway in England, though its users were scarcely its advocates: for the average Englishman talks but little.

It is worthy of notice at the present time that pyrogallic acid appears to have been gradually growing in favour, and it seems now to be very generally recognised as an agent that can be with great ease adapted to the making of negatives from plates exposed under very various conditions. But pyrogallic acid must have an alkali with it, and many, with considerable show of reason, use also sulphite of soda. What shall the alkali be, and what shall be considered an approximation to the quantity of sulphite of soda? are questions now so variously answered by practical men that the competent theorist has here an opportunity of exercising his skill

The quantity of sulphite of soda originally suggested by Mr. Berkeley was four grains to each grain of pyrogallic acid; but since then we have been told by various makers of formulæ to use quantities varying from two grains up to fifty grains to each grain of pyrogallic acid, and perhaps even these extremes have been exceeded. If the two or four grains is efficient, what advantage is there in the larger quantities?

And concerning the alkali, it only needs one to turn over a few pages of current photographic literature to see that the carbonates of soda and potash enjoy a very wide popularity, at least upon paper, ammonia apparently being put away as dangerous, changeable, and in every way undesirable. But still ammonia is used by probably the majority of operators, and some actually whisper that it is a far more useful friend than any other alkali. It is possible that in a few years potash and soda will have had their day, and that ammonia, which has hitherto held its own, will be acknowledged to be the superior alkali. In the opinion of some, this possibility is a probability.

It is curious to notice how that in things photographic an original process has often outlived its improvements. Glass was a great advance upon paper as a support for the negative film, but the next advance goes back to paper. Perhaps, in the matter of the alkalies used in development, we shall have another example of this sort of progress.

* * *

THE AIMS AND HOPES OF PHOTOGRAPHY.

At the opening of the session of the Dundee and East of Scotland Photographic Association, G. D. Macdougald delivered an address, of which the following is an abstract:—

The two great lines along which photography is advancing are—First, as a means of furthering the acquisition of scientific fact. Secondly, as a means of producing works of art. And he would, indeed, be rash who would indicate which side or facet of this interesting art-science has the greatest claim to attention.

The art photographer looks upon all technicalities of the art as secondary matters. Experience gained during his ordinary work forces him to recognise the subtile properties which belong to each lens in what he terms his battery, and the wonderful nature of the transformations which occur during the chemical processes; but these things are interesting only as a means to an end. So long as these lenses and processes give pictorial results which may appeal through the eye to the heart or mind, he troubles himself little about what appears to him as the terribly dry-as-dust outs and ins of the scientific photographer. The other section of workers are those who look to the scientific possibilities connected with the art. They are photographers because this drawing by the action of light on chemical substances provides them with a weapon of original research, and a powerful instrument for adding to human knowledge. The dymanic or chemical changes which are induced by light are appreciated, in themselves, as a kind of side-door through which may be seen just a little of the manner of the building of the great mystery which we call the universe. The art enables them to write down things that come and go too fast, or which through other causes may not be capable of recognition. An ungenerous artist photographer might be apt to laugh at a scientist's pictures, and to wonder, with some show of reason, why a tiny dot, or a thin line, or a tongue or a flame-like mark appearing upon a plate should give exuberant joy. But such things, insignificant in themselves, may have made clear what was before scarcely visible, and have made "the crooked straight, and the rough places plain;" altogether giving ground for as genuine pleasure and satisfaction as the production of a perfect work on canvas or paper.

The picture maker or photographic artist has a rich field in which to exercise his talent—a field, moreover, which in the nature of things must always appeal to a very large, if not the largest, class of persons. It does not require much thinking to become convinced that the power for good or evil of pictures is very great. Pictures speak in a universal tongue. Young and old, rich and poor, lettered and unlettered, may look and understand. The meanest may take away something which may enrich, and make nothing the poorer. It has always appeared to me that in picture exhibitions and galleries we have as powerful a means as is easily within reach of doing good—making gentle the manners and giving tone to a community. Scenes from life, the fruits of the imagination and nature herself, are reflected in pictures, and it follows that pictures must prove in the highest degree attractive so long as nature and life are interesting.

There has been considerable discussion among photographers on the one hand, and other picture producers on the other, as to whether photography has a right to be reckoned as a fine art, and I would be the last to drag into review what has appeared to me on more than one occasion to be very unprofitable discussion. Whether photography be reckoned a fine art or not, it must be borne in mind that if it has advantages over the brush, in one or two particulars it is balanced by weak points, and very weak ones too.

The absence of colour would not be so much felt if the art was competent to reproduce the photometric values of various colours. But in this the ordinary processes of photography fail very conspicuously. Coloured objects not only cannot be photographed in colour, but the shades which represent these colours in the photograph have not the proportionate luminosity that the colours present to the eye. This is a serious defect, and renders photography unable to reproduce certain effects. The ordinary photograph is a picture which may be compared, as regards light and shade, to what may be seen while looking through coloured spectacles. The difficulty of overcoming this defect is increased by the fact that the various sensitive substances used by the photographer have each their own way of interpreting colour. Iodide of silver gives one tone value, bromide of silver another, and chloride of silver a third, so that any attempt to isochromatise, if it be successful, will prove of value only when used with one or other of the sensitive substances.

Efforts have been made to overcome this shortcoming. These are based on filtering through coloured media the light which is to operate on the sensitive material, the colours being adapted to the particular sensitive material, so as to increase their value in proportion to the want of sensitiveness for those colours on the part of the plate. I have likened an ordinary photograph, as regards shade value, to what one may see through a pair of colour spectacles. Now if, when looking, say at a landscape, through a pair of coloured spectacles, we take another pair of a coloured complementary to the first pair, and look through both pairs simultaneously, we will see the landscape reduced in intensity, but, as regards shade value, as if we had no spectacles on at all. An exactly similar process is adopted in recent photographic methods. The sensitive substance on the plate is acted upon by light which has passed through a coloured medium, either present as a stain on the plate itself, or as a piece of coloured glass at the back or in front of the lens. But, after all, such devices, although they effect an undoubted improvement, do not altogether overcome the difficulty.

Photographing in colour is yet a thing of the future. It is known that chloride of silver, under certain conditions, exhibits the various colours under which it may have been exposed to light. But the effect is fugitive. The molecular grouping, or vibratory condition which gives rise to the colour, is at once destroyed on the application of the chemical substances necessary for fixing. During the present year the newspapers announced that some fortunate individual had succeeded in photographing in colour (an announcement which by the way has been made at intervals during the last twenty years), but, so far as I know, specimens of the new process have not yet reached the album of this Society, and we may fairly assume, although the album is filling very slowly, that specimens, when they do arrive, will not find room in its pages. And were this photographing in colour an accomplished fact, I question if it would take the high place some people are prepared to give it. The most perfect colouring, together with perfect outline and detail, will not make up for the difference that exists between a photograph and a painting. The photograph will always bear an impress as of machine-make. We may imagine the photograph of the future already in existence, and assume the presence of colour produced by a photographic process; it will then bear as perfect a resemblance to nature as is possible, and yet, in my view, the direct painting will certainly hold its own in point of human interest. And why? Because the painting is an interpretation of things, wrought out from first to last through the living agency of a human being. The photograph, although controlled by mind, and evidently bearing the impress of thought, is the result of the operation of the machine. The producing force in the one case is mind, which carefully and laboriously, and by prolonged effort, aided only by a bundle of hairs, or a palette-knife, converts a few pigments into a picture. In the other case, although the guiding force necessarily is mind, the actual producing force may be summed up in the touching of a spring, and in the operation of lenses and chemical processes. There is no laborious striving and constant effort of the mind during production.

It appears to me that this looking at things through the mind and eyes of another human being, which in fine constitutes the difference between pure photography and painting, is the point round which centres the peculiar interest of direct art, and that which to the end of time will place painting out of the reach of an art which calls in the aid of machinery. Pictures and poetry are two things which are not improved by machinery.

Painting will always be as interesting to the art public as novels are to the reading public. In both we see in as perfect a way as possible the impressions that life and nature make on our fellow-beings. To certain minds it may appear that painting is a laborious and highly unscientific method of making a picture as compared with photography, which is so instantaneous, and so much in keeping with the times; but an impartial judge must admit that the breath of life which is in the best works of painted art is not to be found to the same extent in photography. As well look for the peculiar poetical force of the opera in a drama.

In one department of photography literal representation by the camera has become unfashionable. Portraits are not now given to the public which are altogether the work of the camera. The friction which existed between the professional portrait photographer and his clients has resulted in the discovery that pure photography will not do, and we have now in modern portraits, almost without exception, a combination of camera and pencil. Now, how has this come about? It used to be quite a popular fancy, and it is so still to a great extent, that the camera alone will give a faithful and true facial representation. A more or less dissatisfied sitter was reminded by the photographer that the camera could not lie; the carefully cherished and apparently axiomatic doctrine which asserted that any representation was neither worse nor better looking than the sitter at the moment was brought into requisition. But all this kind of thing proved of little use against public opinion; "against a sea of trouble" the pencil had to be taken in hand.

Now, speaking mildly, the tendency of the camera alone is to produce a portrait which does not flatter; and speaking with scientific accuracy, the unaided camera does not give a true and faithful representation of the human face. The human face is a more or less red coloured object, and any line, or depression, or mark, or the most mildly coloured freckle, is magnified in intensity out of all proportion to the intensity as seen by the eye. The light emanating from lines, hollows, or other inequalities, is altered through reflection and absorption, and of course does not possess a photographic effect on the plate equal to the luminosity appreciated by the eye. The photographer, through pressure of unsatisfied clients, and a wish to do his best at any hazard, has found a remedy, as I have already indicated, in the pencil; and in using his remedy we cannot very much object if he errs a little towards idealization, and the production of portraits which do occasionally pleasantly astonish those who have a mild opinion of their own good looks, but which in the majority of cases, after all, come but barely up to expectation and self-appreciation. The pencil, then, has already taken its place permanently as an implement in the photographic artists' tool box, and no instrument has a better right to be there for the correction of defective tones or shades.

Whether it is legitimate to materially alter form as well as shade I do not dare to express more than a very humble opinion. I observed not very long ago a photograph of Mrs. Langtry, in which, with the aid of the pencil, some inches—I was about to say three or four, but I hesitate to say so much—were neatly cut off her waist, and an inch and a half—I am perfectly certain about that figure—was sliced off what had been in the original photograph, her shoulders. Is this legitimate? Well, I am inclined to think, yes, so long as it is done so well as to baffle detection. I do not, in this instance, mean to affirm that the camera lied as to Mrs. Langtry's actual form or contour, which apparently, in the view of the artist, required some slight modification. On the contrary, I believe what was tried to be hidden was very nearly, if not quite the truth, and what was wanted to be shown was very decidedly not the truth, and yet with this plainly before me I confess I was quite pleased that the artist had done something to assist nature. I am personally quite willing to look at a carved figure—something moulded into bewitching proportions—if it be well and cleverly done, and, above all, beautiful. In the pencil the portrait photographer possesses an instrument of Mephistophelian power. The old are made young, and the plump are sliced down. Things, by the force of circumstances, are no longer kept as they are. Complete power is given to make them, from the artistic point of view, as they ought to be. And it cannot be gainsaid that things should be made, even in a forcible manner, as they ought to be.

In pure landscape work is the use of the pencil legitimate? In "doctoring" a negative are we stooping to something which we ought to keep secret and be ashamed of? So long as the object in taking a picture is pictorial effect, and not that a Procurator-Fiscal or Coroner may use it in their professional capacity, then every available aid is perfectly legitimate, and instead of being ashamed to admit that a negative has been "doctored," pride should be taken in the amount of judgment and skill displayed towards enhancing effect. Doctoring and masking for cloud effect is now by general consent allowed, but anything further on a landscape is as yet looked on, by some at least, as outside what should be allowed, say to compete in a photographic exhibition. If I may be permitted to express my opinion, I think that the use of the pencil or brush to modify negatives ought to be encouraged amongst the members of such societies as this, for in and by it we have a means of raising the art of picture production to a high level, and combining the undoubted advantages of photography with the supreme advantages of direct art.

It may be advanced by those opposed to this view, that were it carried into effect, the sharp line which separates photographic from direct art-work would disappear, and in many cases it would be difficult to say of particular pictures how much was photograph and how much was not. On the other hand, it will be admitted that the most elaborate retouching of a negative will never take from it the characteristics of a photo-picture, and allowing this were not the case, it is a question whether the sharp line which separates the arts should not be suppressed as much as possible. Is it of importance that we should discover how much is due to the operation of one tool and how much to another? While looking at some masterful painting, do we ask how many models have been before the artist during its production; in other words, how much is copy and how much is imagination? As a rule we are content with the result of copy and imagination in any proportion, if there be produced a thing of sufficient interest or beauty to give pleasure. I think we may look forward to great development in the application of direct art to photography, with a corresponding increase in interest and artistic excellence.

CARBONIC ACID GAS A CAUSE OF BLISTERS ON ALBUMEN PRINTS.

The *Photographic Times* says:—

Dr. Just has said that the cause of blisters on albumen paper will probably be found in the carbonic acid gas of ordinary well water, which exists there in a free state, or united with the lime as carbonate or bicarbonate of lime, and from which the gas is liberated either by diffusion or by the acidity still prevailing in the previously employed bars or solutions. As evidence to prove this theory of blistering, he has called attention to the fact that a formation of very minute gas or air-bubbles are so often observed to settle upon prints which are allowed to rest undisturbed on ordinary water. These small volumes of gas, he argues, penetrate at last through the mass of the paper, or filter through the fine pores of the albumen film, and thus raise the latter free from the paper support, and cause the objectionable blisters.

Long ago it was observed that the contents of blisters on albumen prints were gaseous, and not liquid as had been previously supposed. Various were the theories discussed to explain the cause of these blisters, but the hypotheses brought forward, in most cases, were proved to be fallacious. It was even thought at one time that sulphurous acid gas, or sulphuretted hydrogen, caused the blisters, but this was also quickly proved to be not the case. The question then arose, with what matter are these blisters filled?

We have all observed that the distilled water, rain water, or other water from which, by long standing, the air or gases have been largely expelled, is less liable to cause blisters than that which contains these gases absorbed. The ready-sensitized paper in the market, from which the free nitrate of silver is washed away, to secure good keeping qualities, is further treated with alkali or alkaline salts, fuming in vapours of ammonia, and throughout all operations is treated with alkaline or neutral solutions. It absolutely prevents, as it is asserted, the appearance of blisters on the prints; and when we further consider that out of the same ream of paper blisters often occur for several days in succession, and then suddenly cease to appear, we are forced to believe that there must be a reason why, upon paper of the same quality, and ostensibly prepared in a uniform way, blisters will make their appearance, at times, in great numbers, and, anon, not at all.

Paper which we have sensitized in our own laboratories has not differed in the least respect from the ready-sensitized kind which we have purchased in the shops, for blisters have occurred upon it in the same unaccountable way. We have frequently observed that sudden changes of temperature from cold to warm will invariably produce this annoyance upon almost any kind of albumen paper. Now, if we assume that water which contains carbonic acid has filtered through the mass of the paper support, and has been brought into direct contact with the albumen film, and the temperature of the washing water has been raised to about 20 deg. Fahr., or even higher, is it not reasonable to believe that the carbonic acid gas enclosed between film and paper must necessarily expand, and expand to a greater extent than would atmospheric air under the same circumstances? Returning to the effects of carbonic acid, especially when ready-sensitized paper of a high gloss, and of a kind that ordinarily never shows the remotest tendency to blister, is used, let us refer to an occurrence which recently impressed us in our own practical experience.

For some reason lake water of unusual purity had been substituted by mineral spring water to supply a well-known mountain summer resort. The photographers on the grounds had never had any cause to complain of the quality of the water which they used in all their operations until the change to well water had been made. This new water, which contained a perceptible amount of iron, and, besides various salts, an abundance of carbonic acid, proved, after a few trials, to be absolutely unfit for photographic use. With it blisters invariably occurred upon freshly prepared as well as upon the ready-sensitized albumen paper, to an incredible extent. There were instances of blisters which reached nearly the size of a silver dollar, and which lifted the albumen film in patches entirely from the paper support. And while rain-water washed prints, cut from the same ream of paper, were without blisters, the well water raised them in a few minutes after immersing in the first washing water, to an enormous extent. To examine more closely into the nature of the contents of these large blisters, untoned prints, washed long enough to remove from them all soluble salts, were thrown into freshly prepared and filtered limewater, when several of the large and highest blisters immediately opened, and after a slight agitation made the limewater turbid, thus denoting the formation of carbonate of lime, which was caused by the carbonic acid set free from the blisters on the albumen prints. A few drops of hydrochloric acid subsequently added restored the transparency of the liquid at once.

Well water, which is usually charged with more or less of carbonic acid, and also with atmospheric air, should never be employed, therefore, for washing prints, unless all gases have been carefully expelled from it by boiling, or by long standing.

THE AMERICAN ECLIPSE EXPEDITION IN JAPAN.

BY W. K. BURTON.

After several weeks of travelling in the interior of Japan I find myself at Shirakawa, which is the station selected by the Americans for the eclipse expedition. I am not aware that any one is sending any account to the English photographic papers of the arrangements made here. I therefore write a few lines, although the prospect at present—about two hours before the time of totality—is very poor, the sky being completely overclouded.

The American expedition is under the direction of Professor D. P. Todd, of Amherst, who is assisted by Professor Hitchcock, of the Smithsonian Institute, Dr. Holland the naturalist, Dr. King—a lady graduate of the New York Medical College for Women—and various others. It is by the kind invitation of Professor Hitchcock that I am here. As Mrs. Hitchcock and Mrs. Todd take part in the work, it will be seen that the Americans fully appreciate the assistance that can be rendered by ladies in scientific work. The site selected for the temporary observatory is an old Japanese fort or castle built on a piece of rising ground. It, as well as the whole country around, is remarkably picturesque, but as I shall have something to say of both in a general description of my travels through the interior of Japan, which I hope to have the pleasure of sending to England before very long, I give no description of them here.

The greater part of the energies of the expedition are concentrated on obtaining large photographs of the corona during totality. The members of the expedition have been fortunate enough to secure a lens of very great focal length. It is a single combination, presumably formed after a telescope formula. The diameter is very small comparatively, only about six inches, but the focal length is about forty feet. As every foot of focal length gives rather more than one-tenth of an inch diameter of image, the subject got by this great lens will be rather more than four inches. The arrangement of the apparatus is as follows. The lens is at one end of a horizontal tunnel, and at the other end is built the dark room. This is roomy, contains developing sink, &c., and a stand opposite the end of the tunnel for receiving the sensitive plates. This is, of course, capable of adjustment. There is an arrangement within the dark room for opening to make the exposure, so that everything except the heliostat which keeps the image of the sun directed on the lens is within control of the operator in the dark room. The stand for the plates being within the dark room there is no need to trouble with dark slides, &c. A plate is simply taken from the bath and is placed on the stand.

I should mention that Mr. Hitchcock has elected to use wet plates. He considers that, even with the small aperture of lens he has (say $\frac{f}{80}$), the exposure on them will be ample.

I have seen images of the sun taken by the instrument. These are very good, but show a just perceptible falling off of sharpness at the edge of the disc. This, I was told, is due to want of perfect atmospheric clearness. Probably it is, but in Japan a factor must be reckoned with, which possibly is peculiar to the country. Professor John Milne, F.R.S., who has done more than any other to investigate the subject of earthquakes in this country, has discovered that there is a variable but almost continual earth vibration quite strong enough to be recorded and measured by delicate instruments. Of course this must somewhat interfere with the definition given by the very best long focus lens. I believe this remarkably interesting phenomenon has been investigated so far only in Japan, so that it is not yet possible to say whether it is of volcanic origin, or whether a vibration so great as to be readily recordable exists on all so-called "firm land." Professor Milne's own opinion is that it is due to wind—a vibration being first produced by wind on mountains, and afterwards conveyed through the earth. If this is the case the phenomenon will probably be found to be common to all mountainous countries. May it be that this factor, so far as I know not yet taken into consideration by astronomical photographers, accounts in whole or in part for the great rareness of a successful photograph of the moon on any large scale?

At the temporary observatory here, both the objective and the stand holding the plates are placed on solid foundations made of great blocks of granite, so that all possibility of vibration has been avoided so far as possible. Besides this forty-foot telescope a smaller one, of about 10 or 12 feet focus, is directed towards the position that the sun will occupy during the eclipse. It is proposed, with this, to make very short exposures, so as to show the phases before or after totality. Several appliances were fitted up to investigate the distribution of light in the outer corona. The smaller of the two telescopes was fitted with one of these. The arrangement is one whereby a plate is exposed with in front of it a sheet of tin perforated with a number of small holes, it being considered that the variation of density can better be judged of by observing the small spots thus produced, than by examining the gradation of density that would result were no perforated sheet interposed. There was, however, fitted up a pair of cameras side by side, one provided with the perforated sheet, the other without it, so that judgment might be made in either way as desired. In the case of these cameras, as no fine definition was required, single lenses somewhat after the nature of condensers were used.

One more observation was attempted. Its object was to decide the amount of light during totality. Two appliances were fitted to accomplish this. One consisted simply of a series of apertures of the same size arranged in front of a sensitive plate. These apertures were to screen exposures of different lengths by opening a shutter in front of them, withdrawing it so as to expose first one aperture, then, after a measured length of time, to withdraw a little more so as to expose two, and so on. Another appliance designed by Professor Hitchcock consisted in an arrangement not very unlike that of Mucklow and Spurge's sensitometer. A certain number of cells, each ending in an aperture, were made of wood, forming a sort of honeycomb structure, the apertures varying in area, and the whole arrangement of cells and apertures was placed in front of a sensitive plate. Of course the portion of the plate forming the end of one particular cell would receive an amount of light proportionate to the area of the opening at the other end. Whichever appliance was used the results would, of course, require to be compared with those got by exposing plates of the same sensitive at a measured distance from a standard light. For all the smaller instruments dry plates were to be used.

Taken altogether it is probable that no more complet arrangement was ever fitted out for the photographic observation of an eclipse, and after all, as will, long before the time this reaches England have been well known, to no purpose. All the scientific experts mentioned came several thousand miles to this country and worked hard for a month in fitting up their elaborate appliances, and then, all through a cloudy afternoon, nothing could be done, or next to nothing. No observations whatever could be made during totality, and only a very few imperfect ones before and afterwards.

In spite of the fact that the corona was not visible at all, the experience of the total eclipse was an interesting one. The light waned very perceptibly for long before totality began; but the darkening when the moon completely covered the sun's disc was far more sudden than I could have imagined possible. It was all but instantaneous, and the sensation produced was very curious. The darkness was by no means as great as that of a dark night. I could follow the hands of my watch during the whole time of totality, but it was only by close observation. Then, when totality was over, the bursting into light again was as sudden as the darkening had been before, and there was a feeling as of relief, as if some depressing influence had been removed. In a second or two after the light returned there was a sudden rift in the clouds, and we saw a thin half-circle of light like a bit of silver wire. It was only for a second or two, but the sight was a very beautiful one.

There is nothing to be done now but for the members of the expedition to "pack up" and return to America, bearing their disappointment as well as they can. Bitterly disappointed they all must be except Dr. Holland, who has captured I am afraid to say how many thousand insects, or "bugs," as the Americans call them. Japan must be a paradise for naturalists ; it positively swarms with life.

To-morrow I shall make a photograph of the arrangement of the instrument ; it may perhaps be worth sending as far as England.

P.S. (*written on the 22nd August*).

The results of the observations have, after all, not been so completely *nil* as I at first imagined. No coronal observations were made, but, by the great lens, several phases of the eclipse were photographed, of such a nature as to enable precise measurements of the angular distances of the centres of the earth and the moon for precise times to be made—a thing which, it seems, is desirable. Moreover, Mrs. Hitchcock obtained two very interesting photographs of the earth during the eclipse. One plate was exposed during the whole time of totality (three minutes), the other for twenty seconds, beginning thirty seconds after the termination of totality. The first photograph shows the landscape merely as a black mass against the sky ; the second shows considerable detail. The lens used was one of the rapid landscape type working at about $\frac{f}{6}$.

ORTHOCHROMATIC PHOTOGRAPHY.

BY J. B. B. WELLINGTON. *

Notwithstanding the many statements that have been made with regard to the use of orthochromatic plates for outdoor work, that they were bound to be far superior to the ordinary plate, I think sufficient time has elapsed to have enabled photographers to have fairly tested them for that purpose ; and what has been the result the present Exhibition will show, with one exception, that orthochromatic plates have not superseded others as yet. And why is this ? In many cases they have found but little difference between them and the ordinary plate, and, again, many have found that the use of them entails much greater care in manipulation that they are not worth the extra trouble and cost in using them.

One great advantage of orthochromatic plates (in conjunction with a yellow screen) is photographing outdoor subjects on a slightly foggy day ; the result on an ordinary plate being flat and foggy, on the orthochromatic, crisp and brilliant. But for landscapes with distance, if used with a yellow screen (especially on a clear day), the charm of distance is gone by losing what we call atmosphere and bringing it sharp and clear ; and, again, with shadows which are usually of a bluish grey nature, are rendered much darker than they appear, so that if used at all for landscape a great amount of judgment and experience are necessary. But I admit in some cases it is an advantage to render distance clearer, especially on those occasions when there is too much atmosphere. I think I may fairly state that this is the most difficult branch of anything connected with photography. But when we come to photographing flowers or other close studies in colour, as well as copying paintings, then, to get the best results, their use is absolutely necessary.

We are now approaching the season when, if orthochromatic plates are to prove of any use at all for landscape work, their value will become apparent. I refer to the beautiful tints of yellows, browns, and shades of red, which we see on the foliage at this time of the year, one tree with its sere and yellow leaf standing out in bold relief against some darker green tree which has not yet begun to put on its autumnal robe. I know many have been waiting to try the effect of this latest discovery in photography for this purpose, and I have taken this opportunity of bringing before you two new formulæ which will enable you to try for yourselves whether there is any real value in the process for outdoor work. I think it would prove interesting if members were to bring the results of their trials in this direction before the Club ; an ordinary plate should be exposed at the same time.

What I specially claim at present is the use of quinine in conjunction with the dyes for the purpose of prolonging the keeping qualities of the stained plates, and also treating the dye itself with chloral hydrate. In fact, quinine has many other advantages in connection with photography, and no doubt before another year has elapsed we shall have many uses to which quinine will be put. One little use, or novelty I perhaps should say, I discovered only a few weeks ago, and which will serve as a short paragraph for the coming Almanac.

My formulæ, although working satisfactorily, might, with advantage, be made less complicated, at least for those who wish to make it up ; but I hardly see my way of doing so at present so as to keep all the existing good qualities in it, and I thought it would be a pity to wait till all further experiments were completed, as every one knows that experiments create experiments, and so we may go on almost for ever.

The two dyes which I propose to bring before you are cyanine, which is well known, and methyl violet. Cyanine, in my opinion, has a greater range of colour sensitiveness than almost any other dye, and is most useful in copying paintings, where, as a rule, a large amount of red is to be found. This dye is particularly sensitive to red, and sufficiently so to green (I am referring to copying, and not to the spectrum), which is not the case with erythrosine, which barely extends beyond the yellow, being quite insensitive to red ; and, moreover, this dye (cyanine) has no action on the gelatine like some other dyes, but develops clear and brilliant as any ordinary plate.

Between cyanine and methyl violet there appears to be but little difference in colour sensitiveness. The cyanine is a trifle the more sensitive to red. On the whole, perhaps, methyl violet is preferable to use, not only on account of its price (which is one-fortieth that of cyanine), but it appears to me that when it has commenced to develop the sensitiveness to yellow is somewhat destroyed, and more yellow light can be used in developing than is the case with cyanine. But great care must be taken when dipping the plates, placing them in the dark slides, and again into the developing dish, which should be done in almost total darkness. This applies more forcibly when using cyanine.

Now to come to the formula of cyanine. I find by treating it with chloral hydrate and again separating by means of ammonia, it is much improved, and does not precipitate when added to an aqueous solution, which untreated cyanine does, as many no doubt know who have tried it. Take—

Choral hydrate	1 ounce
Cyanine	10 grains
Water	4 ounces

Boil together in a water bath, when the cyanine will be found to be dissolved. Keep stewing for twenty minutes, then add one ounce of liquor ammonia carefully ; ebullition takes place, and chloroform is liberated, therefore it is advisable to do this in the open air. After a few minutes, the cyanine will be found adhering to the sides of the vessel, the supernatant liquor being carefully decanted away, the residue being rinsed once or twice with water. Eight ounces of methylated spirit is now added to dissolve the cyanine, together with 120 grains of soluble sulphate of quinine. Dissolve the latter by heat in a small portion of the spirit first ; finally filter through a small filter paper. The solution will keep as long as a dipped plate—viz., about four to six weeks.

For dipping, take of the above—

Cyanine solution	1 drachm
Liquor ammonia	1 „
Water (distilled)	20 ounces

A weaker or stronger solution may be used to suit various plates. The weaker it is, the longer will the plates keep. As a rule, a plate of medium rapidity will be found easier to work than one of extreme rapidity. The cyanine is added to the water, the drachm measure washed out, the drachm of ammonia next measured out and added to the cyanine and water with stirring. If the ammonia is poured into the same measure which contained the cyanine, a precipitate of quinine takes place, which does not happen if in a diluted form ; thus the reason of adding the cyanine to the twenty ounces of water first, and finally the ammonia.

For a half-plate, take two ounces of the above diluted solution and flow over the plate, and keep rocking for two minutes, after which throw the solution away. On no account must the same be used for another plate, as great irregularity will result in the rapidity and colour sensitiveness of the next plate. This applies to all dipping operations. The plate now dipped is to be dried in total darkness.

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* A Communication to the Photographic Club.

For methyl violet the treatment required is somewhat different. The dye used by itself produces fog, which baffled me for some time to get rid off, but finally I succeeded by treating it with an oxidiser, such as bichromate of potash, and then proceeding as with cyanine, viz., by treating it with chloral hydrate. But this latter treatment is not absolutely necessary; in fact, there is so little difference worth speaking of that you may as well disregard this latter treatment. Take—

Methyl violet	10 grains
Water	4 ounces
Bichromate of potass	½ ounce
Water	2 ounces

Raise both as near boiling as possible, and mix. Keep in the water for half an hour, collect the precipitate by filtration, and wash by passing water through the filter. By this treatment it is no longer soluble in water, as was the original. Dissolve the filtrate in methylated spirit containing 120 grains of the soluble quinine sulphate, and filter.

For bath take—

Methyl violet solution	1 drachm
Ammonia	1 ,,
Water, distilled	20 ounces

To get any decided effect at all on orthochromatic plates, a yellow screen is necessary, but many people imagine they will show correct rendering of colour without any screen at all. I have not yet seen the gelatine plate that will do so. Almost any yellow dye will answer, some better than others. I have a liking for turmeric, which I prepare as follows:—

Turmeric	1 ounce
Methylated spirit	7 ounces

Digest on water bath for twenty minutes, and allow to stand a day or two to settle, then decant the clear solution off, about four ounces, and add to this four ounces of methylated ether and fifty grains of pyroxyline. This will make the stained collodion. Coat a piece of patent plate 3¼ by 3¼—ordinary glass should not be used owing to its want of flatness, and with which it is difficult to get a sharp image—take another similar piece of glass and cement the two together by means of Canada balsam, the glass being slightly warm. I have to thank Mr. Debenham for the suggestion of Canada balsam. It not only reduces the reflecting surfaces, but it also renders the film more transparent as well as protecting the film from injury. Clean away the balsam that oozes out, and mount as an ordinary lantern slide. This should be kept in the dark when not in use, as turmeric is bleached by the action of light. I prefer to use it behind the lens, as then it is protected from the light, and the folds of the bellows will prevent it from falling down. With this screen the exposures will be increased about ten times.

Any of the usual modes of development will suit, but I must again caution you to expose the plate as little as possible to the light of the developing room. With these precautions I can ensure success to any who may employ it.

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PHOTOGRAPHY IN THE ALPS.

Mrs. E. Main (Mrs. F. Burnaby), writing in a recent issue of the *St. Moritz Post*, says:—I propose, under this heading, to offer a few hints to those amateurs who intend to work at photography in Switzerland during the coming winter, and who have not as yet practised their art in the Alps. Photography is sometimes, of course, undertaken in snowy weather in England, but the Swiss surroundings are so different to those of our native land, and the atmosphere is so much clearer, that the photographer accustomed to the lowlands is certain to have much to learn when he comes to the heights.

First, let us consider how we should set to work in order to get the best results for a picture of a snow-covered landscape. We must decide at what hour of the day the exposure should be made, towards what aspect the camera should be turned, which objects are to be made the most of, and which are to be sacrificed for the general good of the picture We must remember that snow is not a uniform, white cloak, without character or detail, but that the minutest portions of it are full of exquisite lights and shades, and are often covered with the most delicate, lace-like tracery. All this who should aspire to render with taste and accuracy, and need not despair of getting the most perfect gradations of light and shade even in this, one of the most difficult of subjects.

Now, as to the time for the exposure.

If we can reconcile it with the subject, we shall get the best effects when the sun is low, and the illumination from the side; this throws long shadows, and the minutest detail on the surface of the snow is thus brought out. Never take a photograph, if you can possibly avoid it, with the sun directly behind you: your picture is almost sure to be lacking in variety of depth. Occasionally, when the cloud effects are good, you can get splendid effects with the sun shining straight towards you, more especially if you are working at some height above above the valley, and mountain tops protrude through the brightly illuminated mists. We have not much scope for this sort of work at St. Moritz, but if any of my readers go to Wiesen next spring they are sure to find plenty of opportunity for studying cloud effects, as the trough of the valley, which is more than 1,000 feet below the village, when viewed from the hotels, lies just under the source of illumination, and on stormy days, for an hour or two before sunset, most beautiful pictures can often be obtained.

Should the snow scene which you wish to photograph include distant mountains, trees, and figures or other objects in the foreground, you must first decide to which of these you attach the greatest importance, and expose accordingly, always bearing in mind that the more you increase your exposure, and the more you try to bring out in detail the objects in the foreground, the more do you lose the variety and character of the snow. If you expose with the full aperture of your lens, or with a large stop, you will also fail to render fully the detail in all parts of your picture, and you must carefully consider if the subject, being a snow study, will bear this. As a general rule, a snowy landscape is best rendered by stopping the lens well down (the instrument should be a slow, acting one), and then, with a full exposure, you will get the finest effects. Never attempt to photograph a snow-covered landscape on a dull day. Most of the best authorities agree that sunshine is essential for bringing out the details and variety of such a scene, but one or two well-known photographers have stated that a brightly-lit landscape fails to convey the idea of cold, and that unless this idea is given, the true spirit of the scene is wanting. Now, in England, this may be the case. In the heights of Switzerland it most certainly is not so, for we, who know the winter climate of these parts, have learnt, above all things, to associate brightness and sunshine with the fine weather of which we have so large a share during the winter season in the Alps. Therefore I still hold firmly to my opinion that a snow-covered landscape photographed on a dull day will never make a pleasing picture.

As to the best plates for work on snow, any well known brand of slow plates will be likely to give good results. I have found Wratten and Wainwright's "Ordinary" answer the purpose extremely well. A few quick plates should also be on hand for instantaneous work.

Photographers who intend to travel about and to develop on returning home, will, I am sure, be delighted with Eastman's Stripping Films, if they give them a fair trial, and there is really no difficulty in working them, while the results are as good as can be obtained on glass. If strict attention is given to the following directions, failure should not occur. The newness of the process is my apology for entering so fully into details. The articles required for working the process, in excess of what is wanted for ordinary dry plate work, are as follows:—A gutta-percha plate holder; some glass plates a little larger than your negatives; a bottle of rubber solution, and one of collodion varnish (these solutions can be purchased from the Eastman Film Co., 13, Soho Square, London, or made up according to their directions as furnished with each roll or film); also a filter bottle for the collodion, and an iron dish large enough to hold one of the glasses mentioned above. The film is sold in sheets, which can, by aid of a holder, be exposed in ordinary dark slides, or in rolls for use in the Eastman roll-holder. In appearance, the films are like the ordinary negative paper, and the development is just the same—that is to say, the films, after exposure, are placed in water till limp, and then transferred to the developer (any developer which you have found work well will do) and developed until they appear, in comparison with plates, much too dense. After development come the washing and fixing; you will know when the fixation is complete by the disappearance of all cloudiness and blotches on examination of the negatives by transmitted light. If, however, you find, later on, that the fixing has not been fully carried out, it does not matter, as the negatives can be again placed in the fixing bath after the removal of the paper support. Place the negatives after fixing in clean water, and begin to get the plates ready for their reception. This is done by first polishing them with powdered talc, then coating them with the rubber solution, and when, in a minute or two, this has dried, with collodion varnish. When the collodion has set (and you must not let it set too much, a minute or less usually suffices), wash the plates till all greasiness disappears. Now take a negative, lay it film side down on the plate, and, after drying off the surplus moisture with a towel, place a sheet of blotting-paper over the negative and squeegee down hard. Next stand the plate up to dry for an hour or two, and it will then be ready for the removal of the paper support. This is accomplished by immersing the negative in water at about 150° Fahrenheit. In a minute or less blisters will appear under the paper; should they be delayed, increase the temperature of the water. Leave the plate submerged for five minutes, and then, with the point of a pin (forgive me, O Messrs. Eastman and Walker, but I cling to that pin !), very gently raise a corner of the paper, and, finding that it is quite detached from the film, grasp it, and the paper will leave the negative without any perceptible pulling. Place the negative at once in cold water, and wash well; then immerse one of the gelatine films which are sold in packets for the process, and float it over the negative till it gets limp; it must become very limp indeed. Draw it gently over the negative, removing both from the bath, and avoiding air-bubbles. Now lay on a table, and pass a squeegee (previously dipped in water) several times over the surface till it becomes quite flat, then stand up to dry. When the whole is perfectly dry, it can be peeled from the plate by running a sharp knife round the margin; the film will then leave its support with a very slight pull. Should the film stick to the glass in places, it is probably to be attributed to one or all of the three following causes. Either the drying has been insufficient, the plate not properly cleaned, or the coating of rubber has been too thin, and minute specks of dust on the plate having protruded through it, the film has become attached. The advantage to the photographer in the portability of films in comparison to glass is too obvious to need further remark.

In conclusion, I may add that I shall be most happy to show the finished films, and also demonstrate the art of working them, to anyone who may apply to me.

Reviews.

A Descriptive Handbook of Modern Water Colours. By J. Scott Taylor. Crown 8vo., 70 pages. Price 1s. (*London, 1887: Winsor and Newton, 38, Rathbone Place.*)

We have in this, the latest of Winsor and Newton's "Shilling Handbooks of Art," a concise and carefully written handbook of the colours used by water-colour painters, written mainly with a view of discussing the permanency and compatibility of the various pigments. The three sample charts of the various pigments sold by Winsor and Newton may also be useful.

Anyone now wishing to test for himself the relative permanency in light of the seventy-two sample washes of colour issued with the book has only to mount the three charts in a frame, to the glass of which are attached strips of black paper, so as to partially cover each sample, and to expose the frame in a window, looking south, for about twelve months.

Catalogue of Photographic Reproductions of Works of Art. Price 25 cents. (*Soule Fine Art Co.—Alex. S. Macrae, Agent for Canada—127, Wellington Street, Toronto.*)

Here we have a catalogue of over two-hundred pages, with about fifty items on each page, making a total of about ten thousand photographs. Most of them are of well-known works of art now in the public galleries; but the catalogue includes some photographic studies from nature, also the main works of architectural art in Europe. These photographs can be had at prices ranging from 30 cents to $1 75 cents, according to size, and we need not enlarge on the great educational value of such an organisation for supplying photographs. Those requiring photographs of recognised works of art which may not be found in the catalogue are invited to communicate with the publishers.

INSTANTANEOUS STUDIES.

No. 12.—The City Amateur.

City Amateur. Look here, old man. I'm going in for photography. Everybody seems to be taking it up, and I don't see why I shouldn't. Havn't got much time, you know, but I suppose it's easy enough, eh ?

Photographer. Certainly. Ordinary care and intelligence will suffice. A little knowledge of art and a slight acquaintance with chemistry would be an advantage.

C. A. Oh, I know nothing about chemistry. I thought you bought all the stuff ready mixed.

P. Yes, you can do so, but—

C. A. That'll do for me. I've no time to fool about with retorts and pestles and mortars, and all that kind of thing. I shall start practising with a three-and-sixpenny arrangement. That's good enough to learn upon, isn't it ?

P. Really, I'm not able to say. I've no acquaintance with anything so cheap, though I know they are sold at that price.

C. A. Well, but they'll take pictures, won't they ?

P. Oh, I believe so.

C. A. All right, then; I'll begin with one next week. Can buy a more expensive one afterwards, can't I ? Now what do you do first ?

P. Well, having selected your view you focus the lens.

C. A. Now what the deuce do you mean by that ? You know it's no use your using any technical terms, because I don't understand them.

P. (*after trying to explain what focussing means*). Well, having made the exposure—

P. Eh ? What's that ?

P. On taking the cap off the lens, you know. After doing this you take the plate into your dark room.

C. A. Oh, hang it, I've got no dark room.

P. Well, then, you must wait till the night and use a lamp surrounded by ruby-coloured glass. You can buy a lamp made for this purpose.

C. A. I say, that seems rather a bother. Can't it be done in any other way ?

P. I'm afraid not.

C. A. Well, what do you do when you get in the dark cupboard ?

P. (*to himself*) How on earth am I to explain what developing means ? It's no use going into particulars. (*Aloud.*) Well, you pour some liquid—won't bother you with the name of it—into a little square dish—

C. A. (*delighted at recognising anything he thinks he knows*) Oh, yes, you needn't tell me anything about that. It's the acid you pour in. Smells just like spirits of nitre, doesn't it ? I remember it when I had my portrait taken some years ago, because it reminded me of a cold in the head, and gruel, and that sort of thing.

P. (*who knows the C. A. is thinking of collodion, but does not think it worth while to explain*). H'm. Yes, something of the kind. Well, you shake the dish from side to side, then when you have got on the glass all the picture you think you can get, you take it out, wash it, and put it in another solution to fix it—that is, keep the light from acting upon it any more.

C. A. By Jove ! seems awfully easy. I'll buy a three-and-sixpennyworth next week, and have a try. Oh, I say, it makes your hands awfully black, doesn't it ?"

P. Oh, no.

C. A. Glad to hear it. Ta, ta."

[*Exit, thinking "how easy it is."*

Notes.

G. W. Macdougald's inaugural address delivered before the Dundee and East of Scotland Photographic Association should be studied by all our readers, as it deals with some of the questions of the time, especially as regards retouching.

Mr. Macdougald says :—" I think that the use of the pencil or brush to modify negatives ought to be encouraged amongst the members of such societies as this, for in and by it we have a means of raising the art of picture production to a high level, and combining the undoubted advantages of photography with the supreme advantages of direct art."

Quite right is Mr. Macdougald, if encouraging photographers to use pencil and brush takes the form of educating them how to properly use these tools ; but one thing cannot well be deprecated too distinctly : the sale as photographs, of portraits retouched according to a conventional code, and by manipulators utterly incapable even of constructing the first elements of a portrait, and still less able to paint the final delicacies—it being these that the retoucher ordinarily meddles with ; while such barbarisms as skies printed in upside down, or with the lighting cat-a-cornered in relation to that of the landscape, generally carry their own condemnation.

We should like to see a school of art for photographers established to encourage the very thing Mr. Macdougald wishes to encourage ; but the course of instruction would have to commence at the beginning, not at the end, as is usually the case with teachers of retouching.

As a partial antidote to the falseness and untruth of the usual retouching of portraits, we may once more refer to a handbook on the subject, written by Robert Johnson, and published by Marion and Co. Here we only find the very rudiments of the conventional code as ordinarily taught, but many general principles which, if learned and assimilated, may enable the thoughtful worker to see what is needed, and what is to be avoided.

The Photographic exhibition at Dublin is said to be on the whole a success, although many of the exhibits are already—by reputation at least—familiar to our readers.

As far as we know, there is no reasonably complete reference collection of photographic books in London, but by far the best is that of the Patent Office in Southampton Buildings, Chancery Lane ; the British Museum collection being very notably deficient as regards foreign books.

The Camera Club has made considerable efforts to make its library comprehensive, and with this view has several times issued the following advertisement :—" Wanted, books, pamphlets, or periodicals, English or foreign, relating to photography. State price to Librarian, Camera Club, 21, Bedford Street, Strand."

We are glad to say that the library is growing apace ; but would suggest that the librarian would do well to let our readers know precisely which volumes are required to complete the sets of periodical photographic literature. Certainly, the Camera Club is in theory, at least, a private society, but it is a matter of some public importance that its library should be representative and fairly complete. Some of our readers may have spare volumes.

Year by year the Photographic Society of Great Britain opens its Exhibition one evening for the benefit of those whom the Photographers' Benevolent Association helps, and tickets for the next benevolent night, November 11th, can be had of the Secretary, H. Harland, 181, Aldergate Street, E. C., at the rate of sixpence each. Purchasers of tickets need not consider themselves absolutely bound to be at the Exhibition Room on the evening of the 11th, still it is desirable that they should. Arrangements are being made for a first-rate lantern display.

Each one of those thousands who made an ascent in Giffard's Great Captive Balloon of 1878, was awarded a magnificent medal to commemorate his boldness, courage, and enterprise. True it is that the medal was not exactly gold, but being very big and remarkably well gilt, it was quite equal to the real thing for show and all uses except melting up ; indeed, many of the medallist æronauts of 1878 point frequently to the award with a feeling of just pride and legitimate satisfaction.

How is it that the organisers of photographic exhibitions are so far behind the Giffard Balloon Company in enterprise, as regards the awarding of medals ? We know that in the case of the two hundred and fifty exhibitors at the Show of the London Stereoscopic Society, fifty-four medals were awarded, while at the recent Photographic Exhibition at Florence one hundred and seventy-three medals were awarded, to say nothing of abundant honourable mentions ; but when shall we arrive at the climax, towards which we are fast drifting—a medal for each exhibitor ? In such a case the entrance fee would of necessity be sufficiently high to cover the cost of the medal, to pay other expenses, and leave a margin for the commercialist ; unless expenses could be covered by the admission money. Such an announcement as "Grand Exhibition of the Work of Five Hundred Medallist Photographers" would perhaps attract the public.

The public are getting too knowing about photography. The other day, a lady called at a well-known establishment and asked to see the "artist." "I am the photographer," said the proprietor. "Oh, yes, but it is not the photographer I want to see, it is the artist who works on the negative. I wanted him to take out a bump on my left temple which shows so prominently in the proof you have sent me. The photograph is very nice, but I think it can be immensely improved by the artist." It would appear from this that now-a-days the photographer takes a seat behind the retoucher.

The "new journalism" which seeks to make newspapers a little more than a bare record of facts, has to fight its way. Information which may be readily obtained if it has to be written, is denied when it is to take the form of an illustration. The representative of a City paper waited the other day upon the solicitors who had the case of Glyka, the Stock Exchange forger, in hand, for the purpose of getting permission to photograph one of the forged bills of exchange and a blotting-pad found in the forger's apartments. The solicitor was all civility, but seemed frightened when photography was mentioned. "No," said he, "I'm afraid I cannot help you. It would be certain to be known that you had obtained the documents from us, and that we should not like." Probably he had no decided objection beyond a vague feeling that to accede to the request would be a breach of etiquette. What difference exists between pictorial and verbal information is difficult to see.

The *Allahabad Pioneer* boasts of an art critic who has lately been taking the Simla photographers to task. He remarks that none of the photographic views of Simla give any notion of the real nature of the place: photographers always plant the camera well above the picture, instead of taking it under the *Khud*, and so rendering the declivitous aspect which is best and most characteristic. "We send photographs of Simla home to our friends, but none of them realise in the faintest degree what the place is like." We do not know what the *Khud* is, but it is easy to see what the critic means. There is sense in the criticism, because every place has characteristics of its own, and it is the photographer's duty to find them out. But sometimes the characteristics are too much for the camera. It may be so in the case of Simla. Why does not the critic go in for a little practical photography, and show the photographers where they are wrong?

A correspondent writes: "Is there any truth in physiognomy, and can one's character be read from photographs? I am inclined to think either the whole thing is humbug, or that I am the the most contradictory person under the sun. I will tell you why. I recently sent a couple of my photographs to one of the papers which profess to have a physiognomist on the staff, at an interval of a month between the two, and this was my experience. No. 1 photograph was rather over-exposed, and the print was consequently flat. This was what I received: "Easy, good-natured disposition, readily brought under the influence of others. You have a keen sense of the ridiculous, and are fond of pleasure. Musical. Very generous. A forgiving nature." No. 2 photograph was under-exposed, and there was a little too much top light. This brought the following: "Cynical, and at times morose. Obstinate and self-willed. Cautious, and may be trusted to save money. Ambitious and practical. You have not the slightest taste for music or the arts. We should think you were a good hater." Now, what I should like to know is, which of these two "characters" do I most resemble?

That photography will play a most important part when the time comes for the historian of the future to write the history of the present, cannot be doubted; but it is as yet something novel for a photographic document to be produced as evidence of a past historic event the true details of which have hitherto been matter of doubt. The past event we refer to is the tragic death of Maximilian, the ill-fated Emperor of Mexico, and the photographic document mentioned is a copy of a letter addressed by him to Colonel Lopez four days after he (the Emperor) had been made prisoner. It is sufficient to state here that the contents of the original letter, if it be a genuine one, tend to clear Colonel Lopez of the suspicion of treachery to his Imperial master under which he has so long been resting. Experts will, of course, not accept the letter without due scrutiny; but, in any case, the incident is an interesting one from a photographic point of view, and cannot but set one wondering how many other historical problems will be solved by similar means.

For all we know to the contrary, the world may be startled ere long by the publication of some enterprising amateur's photographic diary—a kind of "Greville's Memoirs"—compiled by the aid of a detective camera, which has been busily and secretly at work in court and political and social circles. If we try and think what additional piquancy and interest would have been added to our old friend Pepy's "Diary," if the quaint Samuel had only been as enthusiastic an amateur photographer as he was cypher-writer, we can then better realise the effect the appearance such a volume of photographic reminiscences as we have written of would have on contemporary society. The hour has come, indeed, for the "Photographic Greville," and if the man be but forthcoming, he is well-nigh certain of fame.

We learn from the *Horological Journal* that the latest novelty in photography is to have a portrait on enamel fixed inside one's watch case. The fancy has taken both here and in the United States. The most improved style says our contemporary, is to have "a disc of enamel on a copper ground, similar to a dial, and this, when snapped into a bezel, forms the dome of the case, the portrait being visible on raising the outer bottom." This may be good news to the watchmaker, since it is stated the new fashion has given quite a fillip to the trade; but what will the locket manufacturer say? The portraits, it seems, are not confined to those of friends or relatives, for one manufacturer, who has just returned from a journey in Scotland, has received orders to supply watches adorned with the features of Gladstone, and, perhaps, other popular favourites may follow suit.

NOTES FROM NEW YORK.

A Successful Artificial Light for Instantaneous Exposures—Developer for Lantern Slides.

Artificial Light.—At the meeting of the New York Amateur Society on October 11th, Dr. Piffard gave a demonstration of the new light which he had been experimenting upon for some time, and made several exposures before the audience, which were developed out very successfully. The simplicity, certainty, and cheapness of the light is its chief merit. About five grains of gun-cotton, such as is used in making collodion, has sprinkled over it from ten to fifteen grains of fine magnesium powder, which is now sold here at forty cents per ounce. This is put on a metal plate, and located about ten feet from the sitter. The cap is removed from the lens, and in the darkness the cotton is lighted with a match. Instantly a brilliant flash results, all is over, and the picture is secured. A picture of a child was shown by Mr. Rockwood in the act of laughing, which was sharp and fully exposed. The flash was as quick as a shutter. A very rapid portrait lens was employed. That such instantaneous pictures can be taken in the midst of total darkness is truly surprising, and will doubtless add another pleasure to the variety of processes the amateur now enjoys; at the same time, it will be of important assistance to the professional photographer.

A Developer for Lantern Slides, of great merit, is made up as follows :—

No. 1.—	Hydrochinon	10 grains
	Sulphite of soda crystals c.p. ...	60 grains
	Water	1 ounce
No. 2.—	Carbonate of potash	30 grains
	Water	½ ounce

Add No. 2 to No. 1, with enough water to make up to two ounces.

Thirty-four slides may be developed with the above solution in succession. The high lights keep beautifully clear, and the resulting plates have a crisp brown colour. The development proceeds rapidly, though perhaps a trifle slower than with pyro. Sulphite.

New York, October, 1887.

Patent Intelligence.

Applications for Letters Patent.

14,684. George Thomas Holloway, 17, Bridge Road West, Battersea, London, for "Improvements in or connected with photography."—28th October, 1887.

14,725, George Sylvester Grimston, Claremont, Glenluce Road, Westcombe Park, S. E., for "Improvements in photographic shutters."—29th October, 1887.

Patent on which the Fifth Year's Renewal Fee of £10 has been paid.

5131 of 1882. H. H. Lake. (*Chaine and others.*)—"Coloured photographs."

Official Abstracts of Accepted Complete Specification.

3,530 of 1887. Boult (*Eastman*).—"Sensitised plates, films, &c." Coating machine: after coating, web passed up and down over rollers, then suspended in loops on drying-frame.

Specifications Published.

15,727. Edward William Foxlee, of 22, Goldsmith Road, Acton, in the County of Middlesex, Photographic Expert, for "Improvements in or relating to the treatment of photographic dry plates or films."—Dated 1st December, 1886.

The Patentee says:—

This invention relates to the class of flexible film from which the paper or other backing is ultimately stripped. Films of this description vary in construction considerably; in some the stripping of the back is done in a wet state, and in others in a dry state. Some of the films are made with a paper backing, an insoluble gelatine film to receive the image, and a soluble gelatine layer interposed between the two. Some makers do not use gelatine at all, but a gelatinous or mucilaginous compound instead. In all cases, however, the film is supported by a backing, generally of paper, which is subsequently stripped off, and to most if not to all of these the present invention is applicable. I will, however, describe it as applied to a plate made according to the Boult (Eastman and Walker) Patent No. 13,596 of 1884, and consisting of the paper backing, the insoluble gelatine film, and the interposed layer of soluble gelatine. I shall use the word "negative" to indicate the insoluble film with the image in it, whether that image happen to be a negative or a positive picture, as it may be either.

An advantage of my invention is that whereas the "negatives" as ordinarily prepared are subject to the attacks of damp and other atmospheric influences, my improved negatives are, when required, coated on both sides with collodion or varnish, which is impervious to atmospheric influences.

In carrying out my invention I take a plate of glass or equivalent material, and coat it with plain or normal collodion, such as that employed by photographers, but without being iodised. Before the collodion is poured upon the plate the latter is treated in the usual way with wax or india-rubber dissolved in one of their solvents or powdered talc (French chalk) or some similar material, to prevent the permanent adhesion of the collodion. When the collodion has set the plate is immersed in a dish of cold water until the ether and alcohol are washed out. This operation may be accelerated by washing under a tap. When the solvents have been removed from the collodion it is ready for the reception of the negative. This having been fixed and washed is laid face downward upon the collodion. An india-rubber squeegee is now employed with some pressure to ensure close contact and expel the superfluous water and air-bubbles, but before the squeegee is applied a sheet of india-rubber or paper is laid on the paper and plate in order to prevent abrasion of any exposed portions of the collodion film. Blotting paper is now placed upon the paper backing of the negative and put under light pressure, and allowed to remain for a suitable time rarely exceeding half an hour. The object of using the blotting paper is to further absorb the moisture, and so secure a better contact between the glass and the film, Next the plate with the adherent negative is placed, without previous drying, in warm or hot water. In a short time the paper will be easily removed, owing to the solution of the soluble substratum or interposed layer of gelatine, leaving the negative firmly attached to the collodion. The plate is now removed from the water, and a thin sheet or pelicle of gelatine which has previously been thoroughly softened in water—or a mixture of water and glycerine—is laid upon the negative and pressed into close contact by a squeegee, a sheet of india-rubber being interposed to prevent abrasion. The whole is now allowed to dry; or instead of applying this sheet in a firm state it may be run on in a liquid state. When the gelatine is dry it is coated with collodion or with a varnish. When this coating is dry the negative is stripped from the glass, when it will bring the collodion film, which was applied to the glass, away with it firmly attached, so that the negative and the gelatine are protected front and back with a film of collodion or with one of collodion and one of varnish.

To facilitate the stripping a sharp knife may be run round the negative, cutting the collodion to prevent tearing.

In some cases where it is not desired to remove the negative at all from the glass plate, as when an inverted or reversed negative is required, it is not necessary to prepare the surface of the glass with talc before running on the collodion; in these cases, when the negative has been attached to the glass and the backing stripped off, it is only necessary to coat the exposed surface with collodion or varnish.

The claims are :—

1. In the treatment of flexible films after exposure the method or process consisting essentially in attaching the "negative" to a film of collodion spread upon prepared glass or equivalent material, and stripping off the temporary backing from the said "negative" or image bearing film, the whole substantially as specified.

2. In the treatment of flexible films after exposure the method or process consisting essentially in attaching the "negative" to a film of collodion spread upon prepared glass or equivalent material, stripping off the temporary backing from the said "negative" or image-bearing film, and coating with collodion or varnish, and finally removing from the said glass or other plate the said "negative" or image-bearing film, so that the finished "negative" is enclosed between two coatings impervious to atmospheric influences, the whole substantially as specified.

3. In the treatment of flexible films after exposure, the method or process consisting essentially in attaching the "negative" to a film of collodion spread upon prepared glass or equivalent material, stripping off the temporary backing from the said "negative" or image-bearing film, applying a permanent backing of gelatine or equivalent material, and finally removing

from the said glass or other plate the said "negative" or image-bearing film, the whole substantially as specified.

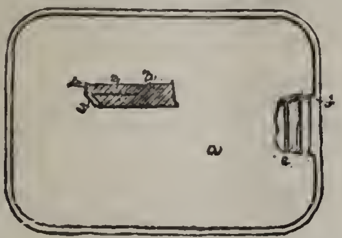
4. A finished "negative" consisting of an image-bearing film having on each side a coating impervious to atmospheric influences, substantially as specified.

15,873. Zachary Harris Kingdon, of 30, Victoria Road, Old Charlton, in the County of Kent, Civil Engineer, for "Improvements in photographic and other optical apparatus."—Dated 4th December, 1886.

The claim is for a folding camera with system of link levers, struts, and flexible body.

Patents Granted in America.

370,727. William P. Clough, Boston, assignor of one-half to George F. Loring and Selwyn Z. Bowman, both of Somerville, Mass., for "Photographic card."—Filed Mar. 10, 1887. Serial No. 230,362. (No model.)

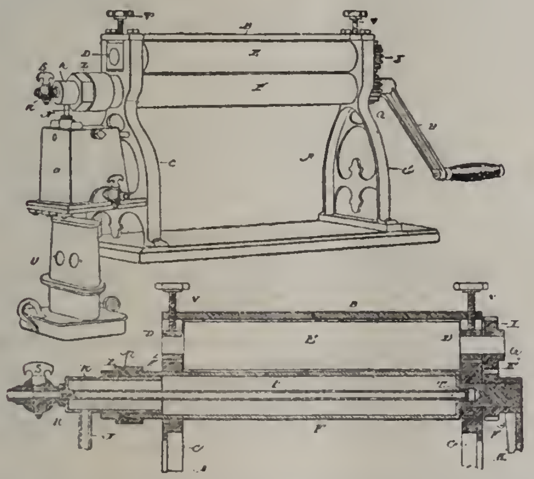


Claim.—1. The card *a* and the anti-warping or stiffening strip having the flat portion 2, substantially incorporated with and inclosed by the card, as set forth.

2. The card *a* and the stiffening or anti-warping strip having the flat portion 2 firmly incorporated with and inclosed by the card at its edge, and having a projecting portion covering the edge of the card, substantially as described.

371,223. Frank A. Simonds, Grand Rapids, Mich., for "Machine for burnishing photographs."—Filed Feb. 28, 1887. Serial No. 229,213. (No model).

Claim.—1. In a machine for burnishing photographs, the combination of the hollow roller F, having one end open and the other end closed and provided with the central recess F^3, the sleeve K fitting loosely in the open end of the roller, the steam-pipe N, communicating with the sleeve, the air-pipe, P, extending centrally through the roller F, and having one end resting in the recess F^3, and having the under end secured in the outer end of the sleeve, and provided with the cock R, and the packing collar slipped over the sleeve and adapted to turn thereon, said packing collar being screwed on the open end of roller F, substantially as described.



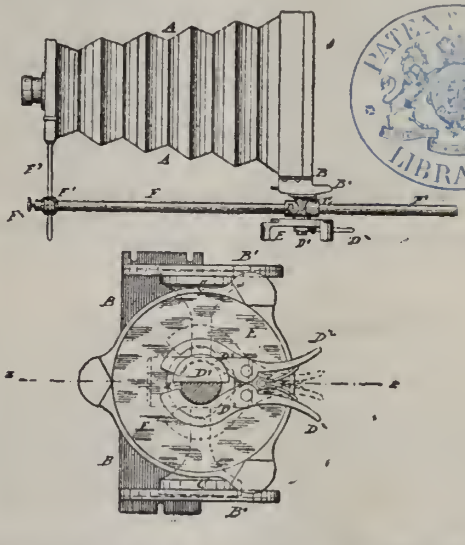
2. In a machine for burnishing photographs, the combination of the hollow roller F, having one end open and the other end closed, the sleeve K fitting loosely in the open end of the roller, the steam-pipe N communicating with the sleeve, and the air-pipe P extending centrally through the roller F, and having the under end secured in the outer end of the sleeve, substantially as described.

3. In a machine for burnishing photographs, the combination of the hollow roller F having one end open, the sleeve K fitting in the open end of the roller, the packing-collar secured to the roller and adapted to turn freely on the sleeve, and the pipe N communicating with the latter to admit steam to the interior of the roller, for the purpose set forth, substantially as described.

4. In a machine for burnishing photographs, the combination of the hollow roller, the pipe N to admit steam to the interior thereof, and the air-pipe P, arranged within the roller and out of contact therewith, for the purpose set forth substantially as described.

371,352. Hans P. Pedersen, Brooklyn, N. Y., "Photographic camera."—Filed May 4, 1887. Serial No. 237,023. (No model.)

Claim.—1. The combination, with a camera, of a supporting-plate attached to the front part of the camera and provided with arc-shaped guideways, a transverse piece or bridge engaging said ways, and an adjusting-screw swivelled in a keeper on said bridge, and its shank engaging a swivel-nut on said supporting-plate for adjusting said supporting-plate on said bridge, substantially as set forth.



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2. The combination with the top piece or platform of a tripod, of the supporting-frame of a camera having a grooved shank, and spring-actuated jaws fulcrumed to the under side of said platform and adapted to engage the grooved shank of the supporting-frame, substantially as set forth.

3. The combination of a camera having a supporting-frame and guide-sleeve at the front end, a longitudinal rod guided in said sleeve, a socket-sleeve and set-screw at the rear end of the rod, and a vertical rod attached to the rear part of the camera and adjusted higher or lower in the socket-sleeve, substantially as set forth.

Correspondence.

PHOTOGRAPHIC EXHIBITION AND THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Dear Sir,—The P. S. of G. B. have very kindly placed their Exhibition at the disposal of the Association on Friday, November 11th, from seven to ten p.m.; a charge of sixpence for admission will be made for the benefit of the funds. I should feel obliged if you will kindly find space for this announcement, as it will doubtless aid to ensure success.—Yours truly, H. Harland, Secretary.

Offices, 181, *Aldersgate Street, E.C., October* 31st.

THE IMPROVEMENT OF OVER-EXPOSED NEGATIVES.

Dear Sir,—Under the above title, Mr. E. Dunmore describes in last week's News a combination of reduction and intensification, and I gather from his paper that he thinks this treatment is novel. In the News for 1885, page 340, I fully described the principles of this combined treatment as well as the treatment itself, and I have endeavoured to never lose an opportunity of insisting upon the change of character brought about in a negative by a partial action of either an intensifier or reducer. I am glad that Mr. Dunmore has found the practical value of these principles.—I am, yours faithfully,

Chapman Jones.

WHAT IS AN AMATEUR?

THE YACHT PHOTOGRAPHS.

Dear Sir,—Would it not have been more graceful on the part of Mr. A. J. West to have taken his beating in good part, and to have acknowledged Mr. Hyslop's undoubted power as an amateur yacht photographer, by admitting the justice of the awards in his favour both at Falmouth and London (and I hear to-day he takes the medal at Dublin), than to have virtually made an enemy of the *facile princeps* in marine work? Mr. Hyslop should, in my opinion, join the ranks of the profession, for I am sure his work is too good to be lost to the public. He would be cordially welcomed by the brethren, amongst whom I am proud to subcribe myself,—Yours truly,

T. G. Buchanan Wollaston.

Lennie, Chislehurst, Kent, November 1st.

Proceedings of Societies.

Photographic Society of Great Britain.

At the adjourned discussion of the proposed new laws which took place on the 25th ult., Rule X., paragraph 24, was passed without amendment as follows:—Should it happen that an insufficient number of nominations is received by the 21st day before the annual meeting, the Council is to have power to nominate members to supply the deficiency.

Paragraph 25, slightly amended verbally, was approved thus:—In the event of a vacancy occurring in the Council, the Council may fill the same till the next annual general meeting.

Rule XI. The members was then read as follows:—

26. Each ordinary member shall pay an admission fee of one guinea. The annual subscription shall be in all cases one guinea per annum, the first and all subsequent subscriptions becoming due in advance on the 1st of January in each year. Members elected after June in each year shall not be liable for that year's subscription.

27. Members may compound for their future annual subscriptions by the payment of ten guineas in addition to the admission fee. Members desirous of thus compounding may do so at any time, provided that all subscriptions due at the time of compounding be paid.

28. Members residing abroad may be exempt from their subscriptions, provided due notice in writing shall have been given to the Secretary previous to their departure; such members shall not be entitled during the period of non-payment to any of the benefits or privileges of subscribing members.

29. The payment of the admission fee shall be considered as distinctly implying the aquiescence of every member elected into the Society in all the rules, regulations, and laws thereof.

30. Every candidate for admission into the Society must be proposed by two or more members, who must sign a certificate in recommendation of him, which must set forth the name and place of residence of the candidate, and state that he is desirous of becoming a member of the Society; and the proposer whose name stands first upon the certificate must have personal knowledge of the candidate.

31. The ballot shall take place at the ordinary or annual meeting at which the certificate shall have been read, having previously been passed by the council, and immediately after such reading; but the ballot shall be adjourned unless twelve or more members be present; and when four-fiths or more of the members balloting shall be in favour of the candidate, such candidate shall be declared duly elected.

32. Ladies shall be eligible as members of the Society.

33. The ordinary members shall have the right to be present and to vote at all ordinary and general meetings, and to propose candidates. They shall be entitled to the use of such instruments or books as the society may possess, under such restrictions as the council may deem necessary, to receive the numbers of the Society's *Journal* as they appear, and to free admission to any of the exhibitions of the Society. They shall have the privilege of introducing visitors to the ordinary meetings of the Society, and to free tickets for any of the exhibitions of the Society. No member shall have the privilege of voting on any occasion unless he shall have paid subscription for the previous year.

34. Honorary members shall be elected by the council, and shall possess all the privileges of ordinary members, excepting those of proposing candidates, voting, and of introducing visitors.

35. The non-payment of subscriptions for three successive years, after due application has been made by the treasurer, shall be considered as tantamount to resignation of membership, and the names may be removed from the books of the society; but arrears so accumulated shall still be considered as due to the society, and the council shall be empowered to publish the names of such defaulting members in the Society's *Journal.*

J. Werge opposed the extra charge to new members, and he believed the general opinion of photographers was against the payment of £2 2s. the first year. He felt sure a good many would become members if the levy was £1 1s. for the year, no matter when elected. He moved to amend clause 26 by omitting the first and last paragraphs.

W. M. Ashman seconded, for the reason that several members of the South London Society had been admitted without payment of entrance fees, and he knew a good many who wished the extra guinea charge abolished.

The Chairman said it was customary in most societies to fix an entrance fee—did Mr. Werge wish to abolish that? He was aware that one gentleman had been elected without being called upon to pay an entrance fee.

J. Werge: I wish the subscription to be a guinea a year.

T. Samuels would not support the amendment, because if a candidate waited until June he would save his guinea. He thought it better to leave the rule as it stood.

W. Bedford pointed out that the large annual increase of members which took place in November was due almost entirely to the exhibition exhibitors having the charge for wall space remitted from their first subscription.

W. F. Donkin said that as regarded those elections a guinea was paid in November for that year, and the second guinea was not paid until February of the next year.

T. Sebastian Davis was in favour of retaining the entrance fee. It meant something more than paying the money. The member acquiesced in the rules and regulations laid down.

The amendment was then put and lost. The rule stands as above set forth.

J. Werge moved an amendment to paragraph 27, to prevent the right of a member to compound.

This was objected to by Captain Abney and others, but as there was no seconder, 27 was declared duly accepted.

J. Werge then moved that all members who have paid subscriptions regularly to the Society for twenty years shall enjoy the privileges of the compounders.

S. G. B. Wollaston seconded the motion.

T. S. Davis saw no objection to this motion. If a member had done so well as to regularly pay his subscription twenty years, the Society could afford to retain him as a member for the remainder of his life.

Captain Abney pointed out that compounds represented invested capital, or should do so; whereas annual subscriptions and entrance fees formed the income spent annually. All compounds ought to be invested, he said.

W. Bedford explained that every year the total number of compounds grew from additions, and this must be expected to increase as the Society went on. He thought they might certainly find some better way of spending their income than that of pensioning off old members.

T. Bolas enquired whether Mr. Werge could point out any Society which pensioned off its members after twenty years' payment of subscription, as that might afford an argument in favour of the change.

Mr. Werge was unprepared to do so.

The Chairman said he was once threatened with a writ for £300 on account of the Society's debts; then the Society's funds were low, they needed to be careful, or they might again be similarly situated.

Mr. Werge's motion was then put and lost.

In reference to paragraph 28, Capt. Abney moved to omit "previous" on the second line. This was agreed to.

A. Mackie inquired what would happen if a member did not pay his entrance fee.

T. Sebastian Davis: He would not be a member.

A. Mackie: Then there are several here who are not members, and if the qualification of membership rests upon the payment of the entrance fee, the rule ought to be amended, as the seven or eight gentlemen I refer to have not legally acquiesced or subscribed to the rules and regulations.

The Chairman did not see how the matter could be dealt with, as these elections took place some time ago.

A. Mackie moved an amendment that "admission fee" be altered to "first subscription."

W. M. Ashman seconded it. Upon a show of hands, this was declared not carried.

A. Mackie suggested, in connection with paragraphs 30-31, that the balloting should take place at the next ordinary meeting following the meeting at which the names had been proposed.

Capt. Abney said the names of candidates for election should hang in a conspicuous place in the room, and he thought it better that the balloting should take place the same evening the names were read out; but at the end of the meeting. He then formally moved that "at the end of such meeting; the names to be suspended in a conspicuous place," be substituted for "immediately after such reading," par. 31, line 2.

A. Mackie seconded. Carried unanimously.

Paragraph 32. Agreed to.

33. Captain Abney moved and T. S. Davis seconded that "two" visitors be the limit allowed to each member. Agreed to.

Paragraph 34. A. Mackie proposed to substitute "may" for "shall" after "members." Agreed to.

Paragraph 35. Line 2, "by the treasurer," was ageeed to be omitted.

XII.—*Photographic Exhibition.*

36. The Society shall hold annually an Exhibition of photographs and objects connected with photography. Members of the Society shall have the right of exhibiting at such exhibitions under limitations to be laid down by the council. Contributions shall also be received from other than members of the Society. The council shall decide on the rules for such exhibitions, and shall have the absolute right of refusing any picture or article.

Paragraph 36. Captain Abney wished the rule modified as regards "shall hold annually," first line.

W. Bedford thought more than one exhibition might be advisable during some years. Better to make it exhibitions.

T. Samuels regarded the exhibition as an incentive for increasing membership, and said it ought to be stated in the rules that there will be such exhibitions held.

A. Mackie agreed as to the benefits the Society derived by its annual exhibition, and he believed three-fourths of the members joined on account of the exhibition facilities afforded them.

S. G. B. Wollaston: The rule says members have the right of exhibiting, &c., so that is a distinct promise that an exhibition will take place.

T. Bolas considered it a mistake to give anyone the absolute right of exhibiting; by so doing they might be compelled to hang any number of frames by anyone first of all becoming a member.

T. S. Davis replied that the council had the right of refusing any picture, no matter whether the sender be a member or not.

S. G. B. Wollaston proposed that the judges be nominated by the body of members, and he did so owing to the unsatisfactory system of judging, which prevented many photographers from sending their best work.

J. Werge seconded it, considering it a very desirable change, as there would be less favouritism if the judges were elected by the whole of the members instead of the council.

T. Bolas cordially supported the plan. The Society, he said, could not be too democratic in this respect. The plan would avoid spirited complaints of the awards in future, if they took some little trouble in formulating the best method of judging.

W. Bedford hoped a little time would be given to the consideration of details.

J. Werge suggested the President *pro. tem.* be one of the judges.

The Chairman always avoided voting; he wished to know how the scheme was to be worked out. The proposers ought to be prepared with details to submit to the meeting, otherwise he could not receive it.

W. M. Ashman suggested a short rule be made at once, that being a special meeting to consider any rule.

S. G. B. Wollaston thought the matter could not be properly brought forward then, as the meeting was not sufficiently representative.

Capt. Abney proposed that it be referred back to council, so that the details of some scheme might be brought before next meeting.

After some further discussion, S. G. B. Wollaston moved, Capt. Abney seconded, as an addenda to Rule XII, "that if the necessity arise for awards, the election of judges be in the hands of the body of the members." Carried, also remainder of Rule XII. Par. 37, carried; 38, "special" altered to "general" at the suggestion of A. Mackie, who also succeeded in altering 39, line 4, from 30 days to 21.

T. Samuels suggested that two members of council, and two members of the Society, be appointed a committee to take charge of the rules as amended at the next meeting.

W. M. Ashman seconded. This was not carried.

XIII.—*Journal.*

37. The Society shall issue a Journal in such form, and at such intervals, as the council shall direct. The proceedings of the Society shall be published in such Journal.

XIV.—*Alteration of Laws.*

38. Laws may be altered, varied, or revoked, and new laws made, at special meetings only.

39. No motion to alter, vary, or revoke any existing law, or make any new law, shall be entertained by a general meeting unless notice in writing, signed by twelve members, containing the substance of the proposed motion for altering, varying, revoking, or making any law shall have been given to the secretary thirty days at least previous to the holding of such general meeting, and to each member of the Society by the Secretary seven days before such meeting.

London and Provincial Photographic Association.

A meeting was held on the 27th ult. L. Medland in the chair.

Prints were exhibited by the Chairman and F. W. Cox.

The following question was discussed:—

A negative of a public person was taken, and a promise made by the photographer at the time not to show or publish it during the lifetime of the sitter. The negative was copyrighted, but not assigned by the sitter. After death, the photographer was told he might do what he liked with it. The death occurred, and the photograph was being published, when the publisher was requested by the executors to desist. Have they the power to stop publishing?

W. E. Debenham was of opinion that the photographer was not entitled to publish if he had received any payment for copies supplied at the time of sitting, but if negatives were taken for a specific purpose without charge, then the photographer was sole owner, and had a perfect right to publish.

F. A. Bridge held a similar opinion, but under the circumstances thought publication might be proceeded with, for it was incumbent on the objectors to prove that express sanction had not been given by the sitter, even verbally.

J. B. B. Wellington regarded the question as having an important bearing on photographs taken with detective cameras. Could anyone compel him to desist issuing prints from negatives made in that way?

Several members said certainly not.

W. M. Ashman believed a sitter possessed the right of copyright in his photograph until formally assigned, whether the sitting was paid for or not; but the negative was the property of the photographer.

W. M. Ayres said a case was decided in Liverpool where a sitter was not held liable for damage for breaking a showcase and extracting his photograph.

After some further discussion the question was referred back for further particulars.

A question regarding the value of hydrochinon as a developer for collodio-bromide transparencies elicited the reply that a green tinge was imparted to the shadows.

Which is the best form of condenser for the optical lantern? was a question discussed.

F. A. Bridge used a pair of 12-inch plano-convex lenses with success, but recommended for ordinary purposes two 4½-inch condensers. As long as the subject was well covered, he said that was all that was necessary, and the smaller the condensers to fulfil this condition properly, the better.

The Hon. Sec., H. M. Smith, and W. M. Ayres agreed with Mr. Bridge as to size.

Squeegeeing hypo from silver prints, by passing each separately through a wringer fitted with rubber composition rollers, was referred to, and those members who had experience of the method had not found it practical; one speaker, however, employed it with success for whole-plate prints and under.

A. P. Higgins showed a small pocket spirit lamp, and a pneumatic holder, purchasable at novelty shops for threepence. He thought it would be just the thing for heating small quantities of developer for platinotype work.

The Hon. Sec. announced that the exhibition of the Photographic Society of Great Britain would be specially opened on Friday, Nov. 11th, to benefit the Benevolent fund. He hoped all the members would attend, as he considered it the duty of all photographic societies to lend a helping hand to such disinterested and beneficial work.

Bradford Amateur Photographic Society.

The first monthly meeting of the session was held at Bridge's and Smith's Studio on Thursday last, President D. G. Law in the chair.

Two new members were elected, after which the officers of the previous year were re-elected.

E. J. Smith, the agent for Brin's Oxygen Company, gave a demonstration with the lantern, using the new oxygen gas compressed into steel cylinders. This oxygen being extracted from the air by the barium peroxide, is perfectly free from chlorine, and 50 per cent. cheaper than what has been made before, and the bottles much smaller; the gas is compressed to 1,000 lbs. to the square inch, and is easily regulated by a simple valve. The light was beautifully white and steady, and after 1½ hours exhibition only 3½ feet of oxygen and 4½ feet of hydrogen had been used. A bottle of oxygen large enough for one night's lantern entertainment measures 9½ inches by 3½ inches, and weighing only 8 lbs., it is likely to cause a great change in the lantern and enlarging business this winter.

Photographers' Benevolent Association.

A committee meeting was held on 27th inst. The election by the sub-committee of R. H. Bodle, W. Lang, junr., W. J. Lancaster, J. M. Skinner, S. Bell, J. Stuart, J. Davie, H. J. Thorne, and W. Holt was confirmed.

On Friday, November 11th, the Gallery at 5a, Pall Mall East, will be open from seven to ten p.m. for the benefit of the Benevolent Association. Several well-known gentlemen have promised special selection of slides, which will be shown with the Photographic Society's lantern.

The Secretary reported that several members were seeking re-engagements. It was resolved that a general advertisement should be inserted, and it is earnestly desired that employers requiring assistants should communicate with the Secretary at 181, Aldersgate Street, E.C., or 83, Hawksley Road, Stoke Newington, N.

Liverpool Amateur Photographic Association.

The usual monthly meeting was held on October 27, President George H. Rutter in the chair.

J. L. Mackrell, C. Oyler, and Joseph Walker were unanimously elected members.

The Secretary of the Exhibition Sub-Committee (Mr. Mayne) read a report giving particulars of the proposed exhibition and *soirée*, from which it appeared that they proposed to hold the exhibition in March next for two weeks, commencing Monday, the 5th, in the Fountain Room of the Art Gallery, which had been granted for the purpose; also that about twenty medals, two of which were gold, seven silver, and the remainder bronze, would be offered for competition in various classes.

The President announced that the Council had chosen Messrs. Boothroyd, Boadle, and Thompson, to act as judges in the annual competition, for which that was the last day for entry of prints.

H. N. Atkins gave a hint in regard to film photography, showing a means of utilising ordinary double dark slides for films. He advised taking a piece of stout cardboard about one-eighth of an inch thick, the exact width and double the length of the glass plate; by partly dividing this at half its length it will fold over; a length of film is then taken from a roll an inch longer than the cardboard, this is folded tightly over the doubled cardboard and half an inch turned in at each end, which makes a compact parcel to fit the slide exactly. By placing half a dozen drawing pins into a slit cut at one end in the thickness of the cardboard, the points projecting inwards, when closed they will hold the paper quite firmly.

G. E. Thompson then read a paper, which has already been printed in the journals, on "Picturesque Italy," illustrated by about one hundred and sixty lantern slides projected by the limelight lantern, which was ably manipulated by Mr. Phillips. These slides, consisting of scenes from Genoa, Naples, Pompeii, Capri, Amalfi, and other places, were many of them of great beauty, and were received with much enthusiasm, bringing vividly before the stay-at-home members of the Association many of the beauties of "Picturesque Italy." Mr. Thompson's description of the scenes visited was followed with great interest.

Birmingham Photographic Society.

The usual fortnightly meeting was held in the Technical Schools, Bridge Street, on the 27th inst., Vice-President W. J. Harrison in the chair. John Collier, D. Gwynne, C. J. Husband, James Harrison, G. C. Lloyd, J. H. Mackenzie, A. Pope, W. Walkington, and H. F. Woodward were elected members of the Council.

The Hon. Sec. read a letter from the Camera Club asking for a member of this Society to join the Conference Committee for next year. This was referred to the council to elect a member for same.

A letter was read from A. Constantine, offering five albums for presentation to the Hospital.

F. Place, who was to read a paper on "Lantern and Slides," kindly postponed the same for another evening, as the competiton for the lantern slides shown at the late exhibition had to be decided, and, in lieu of his paper, passed the different competing slides through the lantern. The prize was awarded to W. Tylar (subject to the production of the original negative) for his picture, "Whoa!" a team of horses and waggon in the hayfield; a picture of three geese, entitled the "Three Judges," by E. H. Jaques, and "Fishing Boat," by W. D. Welford, gaining honorary mention as second and third respectively. The judges had some difficulty in making the award, inasmuch as the good qualities of many of the pictures ran very close. Probably, from a photographic view, Mr. Jaques' picture was most perfect, but the composition and general effect placed Mr. Tylar's picture in the front.

After the competition, Mr. Place showed on the screen lantern pictures of the prize, and commended pictures at the late exhibition which W. D. Welford had not only suggested, but had taken himself, and kindly presented to add to the Society's stock of lantern slides.

The meeting terminated with the announcement of a paper for Nov. 10th next: "Collotype, or Practical Lithography," by E. C. Middleton.

Society of Amateur Photographers of New York.

The regular technical meeting was held on October 11th, with President Walker in the chair, who opened the meeting by reading communications from W. K. Burton, of Tokio, Japan, in which he thanked the Society for electing him an honorary member; and one from F. C. Beach, presenting a framed 8 by 10 photograph of the group of eight diplomas awarded to the members of the Society in April last. After drawing attention to subsequent meetings, and election of members, the President read an account of the success which many members had had in the use of hydrochinon in the developer ; though it was perhaps from three to four times slower than pyro, yet it had the good characteristic of not producing chemical fog, permitting the development to be carried on for any length of time, according to circumstances. Furthermore, the solution kept clear and could be used repeatedly, it being possible to develop fifty plates with one given amount to perhaps three or four with the same amount of pyro. It was nine times more expensive than pyro, but by being able to use it repeatedly, brought it down approximately to the cost of pyro. It proved to be a most excellent developer for lantern slides, producing crisp brown tones, and rendering the high-lights clear glass. It was also useful for developing bromide enlargements and prints. The formula recommended by Dr. Piffard and others is the preparation of two solutions in the following proportions :

No. 1.—Hydrochinon...	15 grains
Water...	1 ounce
No. 2.—Carbonate of soda(crystals) C. P. ...	30 grains
Water...	1 ounce

For developing a normally exposed plate equal parts of the above are advised. Over-exposure is remedied by less of No. 2. For lantern slides, both No. 1 and No. 2 are diluted until the right strength of image is obtained.

Dr. **Piffard** then read his paper on the new light for taking instantaneous photographs at night, and supplemented it by several interesting experiments. Magnesium ribbon was burned, magnesium powder and gun powder were mixed and burned, and finally a photograph of Mr. Newton was made by flashing a few grains of gun-cotton on which was sprinkled fifteen grains of magnesium powder. A second exposure was made, with Robert Roosevelt seated in front of the camera, and Dr. Piffard finished by firing a good-sized pistol, having in it a wad of gun-cotton in which was intermingled magnesium powder. A subdued report and a brilliant flash resulted, which was loudly applauded. Subsequently the audience were shown the negatives taken during the evening ; they appear to have had ample exposure, showing the experiment to be highly successful.

Dr. **Higgins** then read a paper on "Finders," showing the principles on which they operate by diagrams on the black-board. He concluded by exhibiting a finder of his own, which was two and a quarter inch one way by one and three-quarter inch the other, and was provided with a ground glass at the back and also on one of the flat sides. In the interior between the back glass and the lens was hinged a mirror, which, when the box laid in one position on the camera, was flat and allowed the finder image to be viewed by transmitted light, while when put on the opposite side caused the mirror to fall and assume an angle of 45 degrees, with respect to the finder lens, resulting in reflecting the image upward on a ground glass, and making it non-inverted. The advantage claimed was that the miniature picture could be seen by looking through the finder or down upon it, just as the operator chose, and it was accurately gauged to correspond with the plate, besides being large enough for one to easily see what was to be taken.

The President then introduced Dr. **Valentine Knaggs**, of London, who spoke of the favourable impressions he had received of American amateurs, and of his pleasure in witnessing the experiments carried on by Dr. Piffard. He expected to depart for London the next day, and should certainly try for himself on reaching home the same interesting experiments.

The **President** remarked that he was always glad to see and welcome any English or foreign amateurs who happened to be in New York, and listened to Mr. Knaggs' remarks with much interest. He then introduced

Mr. **Bellsmith**, representing the Eastman Dry-Plate and Film Co., who made some practical comments on the advantages and uses of the new American film, following them with a demonstration illustrative of the various steps necessary to obtain success. He flowed plates with the rubber solution, then with collodion, then squeegeed the negative down ; then stripped off the paper in warm water, then applied a gelatine skin, as it is called, and eventually, after coating it with collodion, stripped the film off the glass. He said the operations were very easy and simple, and the negatives obtained were extremely uniform. It was advisable to use as small a proportion of sulphite in the developer as possible, since it was inclined to tan and harden the soft gelatine substratum adjoining the paper, and prevent it from dissolving readily in the warm water. When applying the skin of gelatine to the film on the plate in a pan of water, it should be done quickly, within thirty seconds, else the skin, which contained a certain proportion of glycerine, would become too hard and brittle, in consequence of the glycerine soaking out of it.

Someone remarked that the film next to the glass would sometimes strip off with the paper, or raise up from the glass.

Mr. **Bellsmith** thought it was due to frilling, and perhaps to the use of too cold water. He had purposely tried having two or three gentlemen go through the entire process without any instructions from him to see what mistakes they made. One laid the plate with the squeegeed print in a tray of water which he supposed was warm enough. Mr. Bellsmith looked on and admired the patience of the man as he rocked the tray, hoping to see the paper loosen. After a while he concluded the water was not warm enough, and at once poured out some boiling hot water into one corner of the tray. Immediately the film and substratum puckered up from the glass at this corner, and, of course, damaged the negative to some extent. The proper way was to pour the body of cool water into the vessel containing the small quantity of hot, and it was only necessary to have it just warm enough to make the fingers feel comfortable when dipped in.

His demonstration was altogether very satisfactory and successful. The specimens exhibited were greatly admired, and small sample negatives were distributed among the audience.

During a lull in the demonstration, the President explained that he had had a conversation a few days previous with Mr Wells, the representative of the Cramer plate, and elicited from him that Cramer's No. 35 was equivalent to Warnerke sensitomer No. 25, and that it was right speed for detective work. The President suggested that they alter the numbers to correspond to Warnerke, but Mr. Wells made no reply.

Mr. **Beach** exhibited an improved Grimstone shutter, intended to fit in the diaphragm slit of a lens. It had a metal slide less than one-sixteenth of an inch thick, which was actuated by a two-inch in dia. disc, the latter being rotated a spiral watch spring secured in a barrel attached to the back of the disc. The improvement consists in providing a peculiar release, in shape like that of the escapement-lever in a clock. The lower hook of the escapement is made adjustable, so that it can be moved nearer to or away from the surface of the barrel holding the spring. For an instantaneous exposure the lower hook is moved out so that it will clear the cam projection soldered on to the surface of the spring barrel as it revolves. When the pneumatic pump is now operated, the upper hook of the escapement is raised, which in releasing the cam projection allows barrel and disc to make a complete revolution, raising and lowering the shutter disc. If by a layer the lower leg or hook of the escapement is pushed in toward the barrel, it will catch and hold the barrel when it rotates, after being released by the upper hook of the escapement, until the compression on the bulb of the pump is released, then a small wire V-shaped spring pushes the lower leg out, allowing the disc to finish the revolution. The method thus of obtaining a reliable instantaneous and time movement in a shutter of remarkably compact form is extremely simple and effective. The shutter is held open as long as the bulb is compressed. It gives more exposure to the foreground than sky, and saves the expense of having to cut a lens tube, or in having a new one made. Mr. Beach stated that the shutter was handed to him by Mr. Gregg for exhibition, and that the escapement device was his invention. Different sized plates having different diaphragm apertures could be inserted.

Following Mr. Beach, Mr. **Fisk** explained the merits of the new Eastman camera, which was provided with peculiar rods and mechanism for operating the swing of the back. It was very solid, substantial, and beautifully finished. The new Eastman roll-holder, in which the adjustable table at the back is abolished, and the new marking device inserted, was also shown. Mr. Fisk also exhibited a new English camera, very finely made, patterned considerably after M'Clellan's, and a metal pocket camera with shutter. The plate was two inches square, and the lens about two and a half to three inches focus. It excited much curiosity. The large camera could be folded up in small space, and was adjustable to most all kinds of work.

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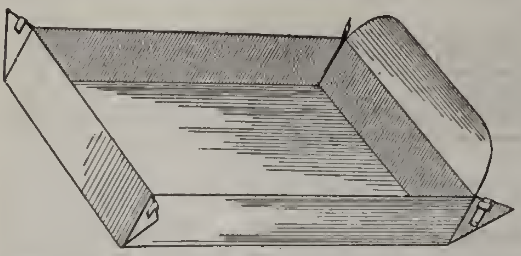
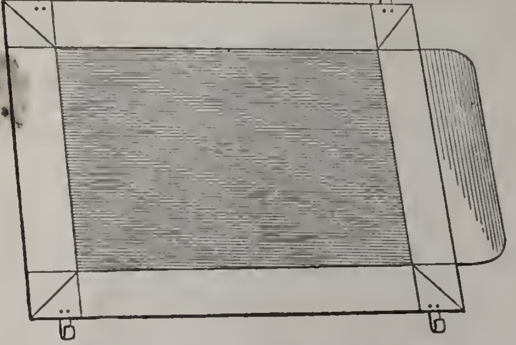
Talk in the Studio.

Tylar's Paper Trays.—There is no novelty in the construction and use of a paper tray—that is to say, a sheet of stiff paper folded up at the edges and fastened at the corners: but the point to which we wish to call attention in connection with some sample trays sent us by W. Tylar, of 31, Yates Street, Birmingham, is the neat and ingenious method he adopts for clamping the corners. At each corner is a hook sliding in a kind of staple, as shown in the second block, and after folding up the sides, this hook is brought down over the double thickness of paper. Here we have the not inconsiderable advantage of no loose parts. The paper used in making Tylar's trays is a coarse brown waterproof paper about the substance of a thick post card.





The Photographic Conference of the Camera Club.—Arrangements are now being made in preparation for the 1888 Conference, which takes place on March 13th and 14th, 1888, in conjunction with which there will also be exhibitions of apparatus, members' pictures, and lantern-slides. By the kindness of the Council of the Society of Arts, the proceedings will be carried on at their hall in John Street, Adelphi. The particulars, as arranged up to the present, are as follows:—Monday, March 12, at 8 p.m.—Smoking Concert at Club House, 121, Bedford Street, W.C. Tuesday, March 13.—The Conference and Exhibition of Apparatus will be opened at 2 p.m. by the President, Captain W. do W. Abney. 2 p.m. to 5 p.m. Papers, at the Hall of the Society of Arts, John Street, Adelphi. 8 p.m. to 10 p.m., Lantern-Slide Exhibition at the Society of Arts. Members are invited to send in slides for selection to the special committee named below. Wednesday, March 14.—Apparatus on exhibition from 10 a.m. in the Library of the Society of Arts. A collection of all novelties and apparatus of interest will be brought together. Papers renewed at 2 till 5.30, Annual Club Dinner for members and friends at termination of Conference at 7.30. Conference Committee—Capt. W. de W. Abney, T. Bolas, F. Cobb, L. Clark, A. Deed, P. H. Emerson, J. Gale, W. A. Greene, C. W. Hastings, R. Martin, F. Machell Smith, Sir G. R. Prescott, Bart.. H. Pringle, Sir D. Salomous, Bart., J. H. Stone, Traill Taylor, Trueman Wood. Exhibition and Apparatus Committee—L. Clark, J. F. Collins, E. Ferrero, W. A. Greene, D. P. Rodgers. Lantern Slide Committee—Capt. Abney, R.E., F. Cobb, J. Gale, F. Howard, H. T. Wood. The President (Capt. Abney), and editing committee (Messrs. Clark, Ferrero, Greene, Rodgers, and the hon. secs.), have been appointed a subcommittee to invite and select papers for the Conference.

Photographic Club.—The subject for discussion on November 9th will be "Instantaneous Shutters."

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To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

Geo. Walter.—James Valentine and Sons, photographers, Dundee, is sufficient address.

G. P.—Thanks, we will write.

W. H. Banks.—1. Sulphurous acid is, we think, much to be preferred as far as the results are concerned, but its use involves rather more trouble. 2. We have not tried it, but doubt whether it really quite fulfils the promise of the manufacturer. Still, if used with judgment, we think it will answer for the work you mention, especially if you select a return point of the jump, and not the period of quickest motion. 3. It is good of its kind, but subject to well-recognised disadvantages accompanying all instruments of this type. 4. Yes, provided that you properly regulate both exposure and development. 5. According to the tone required—from ten seconds to as many minutes. This may surprise you, but if you will make experiments you will find it so.

Robert White.—Full particulars in the forthcoming Year-Book.

A. T. G.—The surface of the paper is probably greasy—indeed, a mere trace of greasy matter will cause the phenomenon, especially when the albumen is insoluble. Until you can get another sample you must blot off. 2. The soap is probably impure; use beeswax and turpentine, or a solution of paraffin, wax, and benzoline. 3. Fine pumice powder rubbed on with the tip of the finger. The pumice must be very fine-sifted—in fact, through very close-meshed muslin. 4. We have never known it to happen, and conjecture that some part of the machine must be so worn as to cause the grip to be lost. 5. The Scovill Company advertise them for sale, but we do not know of anyone in this country who keeps them. Why not get a brass worker to make one?

Teinbridge.—Because the working aperture of such lenses is small—that is, small in relation to the focus.

Aspirant.—Nelson's "Amber" gelatine is very suitable, and, moreover, it is kept in stock by most grocers in a large way of business.

J. N. Norris.—In working away from any large centre of civilisation it is probable that some kind of pyrotechnical light will suit best. On page 160 of the Year-Book of Photography for 1885 you will find details.

W. M. Phillips.—There is undoubtedly a trace of greasy matter present, this being probably an impurity of the original gelatine. Quick and uniform drying will lessen the evil.

E. A. Maxwell.—If we can ascertain, you shall hear from us.

W. L. Nash.—The omission is remedied in the present number.

W. Livingstone.—It has been posted.

W. W. Winter.—We will post you his address.

A. J. C. D.—We are much obliged to you for so kindly sending the additional photographs, and after examining them we come to the conclusion that some such explanation as you give must be the true one.

W. Morgan.—By making the film of gelatine a trifle thicker, and drying at a somewhat higher temperature, we have succeeded fairly well with the process.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

VOL. XXXI. No. 1523.—*November* 11, 1887.

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THE EXHIBITION OF THE PHOTOGRAPHIC SOCIETY.

FIFTH NOTICE.

WE must not pass round the room so quickly as to fail to notice a gem of portraiture, No. 110 ("Little Maude), exhibited by Sir David Salomons. If not the smallest exhibit in the room, it is, at any rate, very small—a child's head and shoulder about "carte" size. Anything that is small is ordinarily placed by the hanging committee either too high or too low for easy seeing; this intelligent body appearing to regard bigness as a specific merit, entitling a work to an increased chance for exhibition on the lines; and in the case of Salomons' delightful miniature, they have carried out these principles by placing it so low as to escape the observation of all visitors but the more observant, and, in addition, they have placed it in the darkest

No. 140.—"THE CHAMPION BLOODHOUND."

corner of the gallery—just where a specially small picture ought not to be placed. "Little Maude" goes far to redeem photographic portraiture from the reproaches cast upon it by several exhibits placed close to it.

F. Downer exhibits "A Private Rehearsal," in which some boys are shown awkwardly holding musical instruments. If those boys can really play, it is strange that they should hold the instruments as they do. At any rate, the production appears to us untrue.

As regards E. Davey Lavender's "Gentleman in Fancy Dress," we cannot well speak too severely—awkward, ugly, unnaturally smooth; who would like to live in the room where this is hung? Still, Mr. Lavender partially redeems his position by excellent and even graceful work farther on: "Miss Winnie Tomlinson" (No. 137) is a delightful picture, and the artist painter may well envy the photographer his power of so recording the pretty smile of the girl-child. Indeed, on account of this, we can forgive Mr. Lavender for No. 124, and also for his "Mr. James" (No. 132), this latter showing a man in straw hat and cross-bar suit. As a character study, it might have been acceptable if labelled "Portrait of a *Gent.*"

That women can become not only successful manipulators in photography, but also reach the far higher ideal of pictorial realisation, needs no mention now; but anyone concerned has only to look at No. 133, "Colonel Yale, C.B.," by Mrs. Brian Hodgson, a magnificent study in portraiture, while Mrs. Hodgson's other exhibits show that the excellence of No. 133 is the result of real ability and artistic perception, and not that sort of accident which enables an indifferent worker to occasionally do something excellent.

The Thames views of the School of Military Engineers are admirable, and the frame 134, which contains four large river pictures, inspires many with the desire to go and do similar work, work which is as good technically as it is excellent pictorially.

Quite exceptional in their merits are the magnificent series of dog portraits shown by Thomas Fall, and well exhibited at the end of the room. They must, indeed, be seen to be thoroughly appreciated, and the block (Dallastint) made from No. 140, "Luarth XI, Champion Bloodhound," must be taken rather as an index to Fall's picture than as a reproduction, it being even now impracticable to reproduce all the delicate tints of a photograph in block form. This series of dog portraits should certainly be published as studies for the use of artists.

There seems to be a notion that Fall's dogs owe their distinctive merit to retouching, a statement which, after careful examination, we can emphatically deny, although a trifling amount of work has been done on the negatives, and this without any attempt to conceal the fact.

It is quite absurd to call No. 148 "The Bride," as it is scarcely anything but a photograph of a very complicated dress; but as such it should interest those of the women visitors whose minds are set in this direction.

The boating, fish market, and other views of R. B. Gilson, Nos. 191 to 196, are worth careful notice, especially by the painter whose work lies in this direction; but we would especially refer such painters to the Turneresque "Harbour of Bergen, Norway" (No. 595), of E. G. Spiers, just the kind of photographic scrap one would like to hang up in one's room, and look at now and again. The outlines are not extremely sharp, but, as a picture, it is none the worse for this.

J. Guardia's interesting flash of lightning (375) we shall shortly reproduce in block form, and hope to be able to give some particulars as to the circumstances under which it was taken.

The Autotype Company do not show quite so large a number of exhibits as on some former occasions, but the standard of the work is as high as ever; No. 282, "A Tree House, Karari Village, New Guinea," is worthy of special mention. It is enlarged from a negative of J. W. Lindt. As regards the very large bromide photographs (enlarged by projection on the Eastman paper), we must confess they do not please us; and, moreover, when one makes a photograph about 8ft. high, is it not a mistake to make it by a silver process? Surely, if worth while to enlarge at all to these dimensions, the carbon or platinotype process should have been adopted.

Ralph W. Robinson comes well to the fore in the present exhibition, and the reputation he has already made will not suffer by his present exhibits. The sleeping child (No. 482), called "Tired Out," is perhaps the best, and it is so natural and free from evidence of "posing," as to be calculated to attract the special notice of the artist painter.

J. Chester Jervis is well to the fore with the delighful studies of Continental scenery for which he has now established a reputation—every one of his seven exhibits well repaying examination.

INFLUENCE OF LIGHT IN CHEMICAL REACTION.

Dr. Armstrong, in the *Journal of the Chemical Society*, writes the following on the influence of liquid water in promoting the interaction of hydrogen chloride and oxygen on exposure to light.

The experiments described by Dr. Richardson appear to establish the fact that hydrogen chloride is not oxidised by ordinary oxygen on exposure to sunlight unless water be present; and thus one more is added to the now numerous instances showing that interactions which are commonly assumed to occur between *two* substances more frequently than not are possible only in presence of a third substance of a catalyst, as I have elsewhere termed it.

Dr. Richardson states that no chlorine is liberated if only one of the gases be saturated, and that it is necessary to saturate both gases with water. On hearing of his results at the recent British Association meeting, I was much struck, and also puzzled, by this statement. The explanation which he has now given in the foregoing paper, that liquid water must be present, however, appears to me to be satisfactory, and it is on this point that I venture to offer the following remarks, in the hope that I am thereby contributing to the appreciation of the importance of observations of the character of those which he has recorded.

The interaction in question is a parallel case to that of the oxidation of sulphur dioxide so carefully worked out by Professor H. B. Dixon, and which I have already discussed in my paper on "Electrolytic Conduction, &c." (*Proc. Roy. Soc.*, 1886. 283). In gaseous mixtures chemical change appears to take place only when a comparatively high electromotive force—or its equivalent—is employed, one sufficient to produce disruptive discharge being usually required; regarding the interaction as a case of electrolysis, a gaseous mixture of HCl, O_2 and OH_2 might, therefore, be expected to prove insensitive to light. But an aqueous solution of hydrogen chloride is one of the best of liquid conductors, and it is easy therefore to understand that a relatively small electromotive force should suffice to electrolyse a liquid system of the same three elements.

From this it should follow that a moist mixture of HCl and O_2, which is effected at ordinary temperatures, would prove to be insensitive to light if the temperature be raised sufficiently to gasify the water. It is also probable that a gaseous mixture of chlorine and water will be found insensitive to light, provided that the temperature be high enough to destroy all molecular aggregates of the two substances: this proviso appears to me to be necessary, as I imagine it is possible that in a molecule which includes both chlorine and water, the direct absorption of light energy may induce a re-arrangement ending in the formation of hydrogen chloride and oxygen.

The study of the effect of light on mixtures of H_2Cl_2, and water at temperatures high enough to gasify the water, would be of interest from this point of view; probably it will be very difficult to entirely hinder the formation of surface layers of liquid, and thus prevent any action taking place; but Professor Dixon's observations on the influence of the amount of gaseous water on the rate of propagation of explosive waves encourage us to hope that the required information may be gained in such a case by studying the rate of change at various temperatures.

It may be pointed out that Dr. Richardson's observation on a mixture of dry hydrogen iodide and oxygen is inconclusive, owing to his having allowed phosphoric oxide to be present with the gases: this substance appears almost invariably to contain either phosphorus or lower oxides.

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THE PHOTOGRAPHIC EXHIBITION IN DUBLIN.

Last week we referred to the opening of the Exhibition, and referred to it on the whole as a success; and we now, knowing more, can very emphatically congratulate our Irish brethren on the very interesting and representative collection of photographs they have got together in the fine galleries of the Royal Hibernian Academy. This is the second Triennial Exhibition of the Photographic Society of Ireland, and although the number of frames is not as large as at the previous Exhibitions, we are glad to note a more general excellence in the exhibits, and much less second-class work. We very cordially endorse the spirit of the Photographic Society of Ireland in their endeavour to break down the barrier between professionals and amateurs, and to place both classes on an equality—this being, indeed, the present policy of the Photographic Society of Great Britain. C. W. Huson, "Early Spring in Val. Crucis Wood," is a production which would be creditable to any professional; also Semple's, "Ovoca," 36 by 24, on alpha paper from a quarter-plate negative, and which has been recommended a medal by the judges, is worthy of mention, and we also notice some nice enlargements of Glendalough, 30 by 24, on the same, by Mr. Kennan; they are from whole plates.

Many of the pictures which we have already referred to as exhibited at Pall Mall are to be found in this Exhibition, as for example :—No. 11, H. P. Robinson's "Carolling;" No. 16, F. M. Sutcliffe's "Water Rats;" No. 48, H. Tolley's "On the Lonely Shore;" and W. H. Hyslop's yachting studies.

The following are the awards :—

Silver Medals.—48, Harry Tolley, "The Lonely Shore;" 89, J. P. Gibson, "The Beautiful River;" 228, W. H. Hyslop, "Yachting Studies;" 458, W. Perry, "Interior Jesmond Towers;" 95, Werner and Son, "Portrait of Lady;" 396, Werner and Son, "Children's Portrait;" 165, W. W. Winter, "The Rhymster and his Victim;" 362, Werner and Son, "Prince of Saxe-Weimar;" 258, C. W. Huson, "Val. Crucis Wood."

Bronze Medals.—276, G. Mansfield, "Old Street;" 250, A. S. Watson, "Studies at Eventide;" 241, West and Son, "Verena and Frolic;" 188, R. Keene, "Interiors;" 107, H. S. Mendelssohn, "Study of an Old Gentleman's Head;" 7, W. W. Winter, "Children's Portrait;" 16, Frank M. Sutcliffe, "Water Rats;" 266, Autotype Company, "Enlargement of Negative by R. B. Berry;" 194, J. C. Semple, "Vale of Ovoca;" 118, James Robinson and Sons, "Portraits on Opal;" 541, G. Davison, "Slides;" 137, G. Davison, "Cottage Studies;" 62, G. S. Waterlow, "Sherringham Woods;" 591, G. T. Jones, "Dogs;" 242, Rev. H. B. Hare, "Summer and Winter."

ORTHOCHROMATIC PHOTOGRAPHY.

BY C. H. BOTHAMLEY, F.I.C., F.C.S.,

Assistant Lecturer on Chemistry and Lecturer on Photography in the Yorkshire College, Leeds.

In considering the patents which have been taken out in this country for processes relating to orthochromatic photography, it must be understood that the author lays no claim whatever to being an expert in Patent law. The Patent law of this country consists mainly of precedents, and the validity of a patent after it has once been granted can only be tested in the Law courts. At the same time, there are certain broad general principles which are tolerably well defined, and can readily be understood without any special legal training.

A patent is only granted to the real inventor of the process patented, and it becomes void if it can be shown that the patentee was not the true and first inventor.

A patent is invalid if the invention was worked for profit by the inventor before the patent was applied for. It is likewise invalid if the invention has been in public use by others than the alleged inventor previous to the date of the application.

A patent becomes void if it can be shown that the subject matter was previously described in any printed book or journal which circulated or was in use in Great Britain, and it is immaterial whether the book is in English or in a foreign language. Information published in this way is rightly regarded as belonging to the common stock of knowledge and no longer the peculiar property of an individual.

Further, it is essential that the invention be so fully and clearly described in the specification that anyone conversant with the art or manufacture to which it relates can carry out the process or invention to a successful issue without requiring any information beyond what is contained in the specification, and without any necessity of making further experiments. This is required in return for the monopoly granted to the patentee, and unless this condition is fulfilled the patent will not hold good. The specification must state precisely what is claimed, and must distinguish clearly between the old and the new in the description of the process. The process or invention must be described fully and in good faith; there must be no attempt to mislead; no essential particulars may be kept back or omitted either accidentally or wilfully; and the description must be clear and free from ambiguity.

On the other hand, if the principle is new, a patentee is not confined to the precise method of putting it into practice which is described in his specification. Sufficient illustration of the practical application of the principle must however be given. If, on the contrary, the principle is not new, a patent can only be obtained for some particular method of applying it, and the patentee is confined to the precise method or methods described in the specification.

The specifications relating to orthochromatic photography are quoted *in extenso* so far as is necessary to explain their meaning; any objections or criticisms that are made must be taken for what they are worth. It is scarcely necessary to say that the writer has no interest whatever in the validity or otherwise of the patents referred to.

The Eosine Patent.—This patent is of considerable interest, since it was the direct outcome of the first successful application of dyes to gelatine plates for the purpose of rendering them sensitive to the less refrangible rays. It is No. 101, 1883; the provisional specification is dated January 8th, and the final specification July 2nd of that year. The letters patent are granted to Charles Denton Abel, "for an 'Invention of Improvements in the application of eosine in photographic processes;' communicated to him from abroad by Pierre Alphonse Attout, called Tailfer, and John Clayton, both of Paris, France."

The first paragraph is historical. It credits Waterhouse with showing the sensitising influence of dyes in 1876, and refers to the application of eosine and other dyes in collodion processes. The subsequent paragraphs are as follows:—

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* Continued from page 568.

"The present invention relates to the application of eosine to the said gelatino-bromide process. The difficulty experienced in this application arises from the fact that eosine gives no result unless it is introduced with ammonia as a vehicle, and it is the combined use of ammonia with eosine that forms the essential feature of the present improved process."

"According to the present invention the gelatino-bromide process of photography is carried out by two different methods, according as it is desired to prepare the gelatino-bromide, or to use plates already prepared. In the former case eosine, by preference previously dissolved in ammonia, is poured into the emulsion of gelatino-bromide of silver at the moment of its formation. The proportion of eosine employed is about one part by weight to one hundred parts of the compound. The eosinised emulsion is spread as usual over the glass plate, and after exposure to the light is treated in the usual manner for the development and fixing of the picture.

"When gelatino-bromide plates already prepared are available, it is sufficient to pour over the dry film the ammoniacal solution of eosine, to which alcohol is added. The plate is then washed, without fear of the removal of the eosine, which becomes immediately associated with the gelatino-bromide.

"This improved eosinated gelatino-bromide process produces very satisfactory results. On the photographs produced thereby, the relative values of the yellow, blue, and violet colours may be easily distinguished."

"Although in what has preceded only eosine has been mentioned, it is to be understood that other acid or saline colouring matters obtained with the various fluoresceines of resorcine combined with metalloids, chlorine, bromine, iodine may be included under the same generic term. Also instead of ammonia alone being applicable as a vehicle for the eosine, other alkalies may be used for the purpose."

"Having thus described the nature of the said invention, and in what manner the same is to be performed as communicated to me by my foreign correspondents, I claim —In photographic processes of the gelatino-bromide kind, the use of eosine applied with alkali as its solvent and vehicle, either in the liquid emulsion, or on the dry layer of a prepared plate."

The first point to be observed is that the term "eosine" is used inclusively, and therefore is meant to comprise erythrosin, rose Bengal, and all the other dyes which are allied to eosin. At the same time, the phrase "acid or saline colouring matters obtained with various fluoresceines of resorcine combined with metalloids, chlorine, bromine, iodine," would not be regarded by a chemist as in any way an accurate description of erythrosin and its allies. There is only one fluorescein, and eosin, erythrosin, &c., as previously pointed out (p. 540), are not compounds of fluorescein with chlorine bromine, or iodine, but *derivatives*, a certain proportion of the hydrogen in the fluorscein being removed, and its place taken by one or other of the halogens. Moreover, there are dyes of the eosin group which have been first prepared since the the date of the patent, and it can scarcely be claimed that a patent covers the use of compounds which were not known when the patent was granted. It might possibly be argued, however, that these new dyes were still "eosins," and that the use of them infringed the principle of the invention.

The most important point, however, is that the patent does not cover the general application of eosin dyes to gelatino-bromide plates, but simply their application *in conjunction with ammonia or some other alkali.* It is, in fact, distinctly stated that "eosine gives no result unless it is introduced with ammonia as a vehicle," and the claim made is for "the use of eosine applied with an alkali as its solvent or vehicle." It is obvious, therefore, that eosin and its allies may be applied to gelatine plates or emulsion in *aqueous* solution, with or without a silver salt, or in any way whatever, *provided that no alkali is used*, and such application will not constitute an infringement of the patent.

Again, in order that a patent may be valid, the invention must be described so fully and clearly that anyone with a competent knowledge of the art or manufacture to which it relates can work it without requiring any further information, and without needing to make any experiments. It may very fairly be questioned whether the above specification satisfies this condition. Even so able a photographer as Mr. W. Bedford has stated (*Photo. Journal*, Vol. XI., p. 73) that he has tried the process as described in the patent, but was unable to obtain any good results, and others state that they have had similar experience. As a matter of fact, the secret of success with the eosin dyes, as with all other sensitisers, lies in using the proper proportion of the dye. It has been clearly shown by both Eder and Vogel that too large a quantity of dye is fatal to any orthochromatic results. Now a one per cent. solution as recommended in the specification for bathing prepared plates, is very much too strong, and gives little or no increased sensitiveness to the less refrangible rays. The addition of one per cent. of eosin to the emulsion would likewise give no satisfactory result. It may be of interest to recall that the amount of eosin recommended by Eder, Vogel, Schumann, &c,, is about 4 milligrams in each 100 cc. of emulsion, or less than 0·004 per cent. ! With the bath process the author obtains the best results with a solution of 1 part in 10,000. The specification, in fact, gives no trustworthy information at all as to the proper proportion of dye to be used, although this information is essential to the successful working of the process. The use of alcohol, too, is unnecessary, and should be avoided.

With regard to the statement that eosin gives no result unless it is introduced with ammonia, attention may be called to the fact that the experiments of Eder and of the author have conclusively proved that both erythrosin and rose Bengal, which are understood to be included in the term eosin, give a very considerable sensitiveness to yellow and green when applied without any alkali at all.

It may also be pointed out that the specification contains no mention of a yellow screen, which is *essential* to the production of *correct* gradations with all plates hitherto prepared with simple alkaline solutions of eosin dyes.

Vogel's Patent.—This is No. 7,963, 1886, and is dated June 15th. The claim is for "An improved process for manufacturing colour sensitive (isochromatic or orthochromatic) emulsions or plates, by dyeing the same with dyes highly sensitive to light." The first three or four clauses are historical and deal with the earlier experiments of the author and others; the following paragraphs contain a summary of Vogel's conclusions and results, and are therefore of sufficient interest to be quoted *in extenso.* He says:—

"Continuing my researches and experiments, I observed that some dyes which absorb coloured rays are not sensitisers for such rays, and ascertained that only those dyes are optical sensitisers which are not only powerful absorbents of certain rays, but which are themselves readily decomposed by light.

"The more readily coloured bodies fade under the influence of light, the better is the same adapted for rendering silver sensitive to light. When this fact has once been established it will be an easy matter to determine whether any new dye or colour is a good medium for increasing the sensitiveness of the haloid salts of silver, it only being necessary to test its sensitiveness under exposure to light, and if it fades readily it is a good medium for rendering such silver salts sensitive.

"In order to carry out this test I prefer to prepare paper, gelatine, or collodion with the dye or colour in question, and expose the same to the light (preferably sunlight) under a perforated screen or photographic negative.

"In this manner I ascertained that cyanine is one of the best sensitisers or mediums for increasing the sensitiveness of the salts of silver employed in photography, and I furthermore discovered other valuable colours for achieving the same object.

"I discovered further that all the red, violet, and blue chinoline and pyridine dyes, which cannot be employed by dyers on account of their fading so rapidly when exposed to light, are first-class optical sensitisers for photographic plates.

"The application of the afore-mentioned dyes is extremely easy; for instance (*a*) the dye is either dissolved in alcohol in the proportion of about 1 : 1,000 alone or mixed with other colours, and then mixed with the prepared emulsion, and with or without an addition of liquor of ammonia or carbonate of ammonia; or (*b*) the dye is dissolved in water alone or mixed with other dyes, with or without adding liquor of ammonia or carbonate of ammonia to the solution.

"The quantity of dye to be added to the emulsion varies according to the quality of the latter, and must be determined by an experiment. An excellent formula for many emulsions is:—

2 to 4 cubic centimetres of a solution of chinoline red in alcohol (1 : 500).
5 drops of a solution of cyanine (1 to 500).
100 cubic centimetres of water.
1 cubic centimetre liquor of ammonia.

The emulsion plates are dipped or steeped in this solution for one minute, and then dried. On the other hand, I have ascertained that the chemical stability of certain dyes, —such, for instance, as cyanine—can be increased to a great extent by combining the same with certain other dyes, so that colours which produce plates which will keep only a short time can be used to advantage in combination with other dyes, whereby plates of good keeping quality are produced. For instance, cyanine is very much improved by an addition of chinoline red, and for the above-named reason I prefer, in many cases, to use mixed dyes instead of single dyes."

Claims are then made in eight clauses for the rendering of photographic plates and emulsions and the haloid salts of silver sensitive to coloured rays of light by treating them (1) with dyes or colours which readily fade when exposed to light; (2) by treating them with aqueous or alcoholic solutions of chinoline, chinoldine, or pyridine dyes, and (3) by treating them with a mixture of two or more dyes applied either successively or simultaneously.

It will be observed that this specification is extremely comprehensive, and is intended to cover all classes of plates and emulsions, and all forms of the haloid salts of silver. It will, however, be obvious to those acquainted with the history of orthochromatic photography that part, at least, of the matter claimed had already become common property by publication prior to the date of the specification. The use of quinoline red, and the use of mixtures of dyes with a view to secure increased stability, might possibly be substantiated as new inventions, but the use as sensitisers of dyes (including cyanin) which fade when exposed to light, was already well known to those acquainted with this branch of photography. A very full account is given in Vogel's own book, "Die Photographie farbiger Gegenstande in den richtigen Tonverhaltnissen," published at Berlin in 1885. The results of the greater part of Eder's investigations were communicated to the Vienna Academy of Sciences in 1884 and 1885, and are described in part 10 of his "Ausfuhrliches Handbuch der Photographie," published at Halle in 1885. To go still further back, the principle of the use of fugitive and other dyes as sensitisers for the less refrangible rays is described in Eder's "Chemical Effect of the Spectrum," a translation of which by Abney appeared in the *Photographic Journal* in 1881 and 1882, and was published in book form in 1883. Moreover, accounts of the various investigations made by Vogel, Eder, Schumann, and others, previous to 1886 are to be found in various scientific and photographic periodicals, most, if not all of which could be and can still be seen at the Patent Office library.

With reference to the claim which Vogel makes in this specification, that "the first isochromatic—*i.e.*, color sensitive collodion—process was published by me in the May, 1884, number of the *Photographische Mittheilungen*, Berlin," it is desirable to call attention to the fact that Ives published his chlorophyll process in the *Philadelphia Photographer* in 1879, and to him undoubtedly is due the credit of producing the first workable orthochromatic process. With regard, likewise, to the statement that dyes which fade most rapidly when exposed to light make the best sensitizers, it may be pointed out that although many sensitizers do fade under these conditions, as previously explained, a necessary connection between the fugitive character of a dye and its sensitising action is as yet by no means absolutely established.

In a specification dated Nov 29th, 1886, Vogel made a further claim for the application to gelatine plates and emulsions of the silver and lead derivatives of eosin and its allies; the application of cyanin, quinoline red, coerulein, &c., together with salts of silver; and the application of ammoniacal or acid solutions of salts of silver which are insoluble in water (Photographic News, this vol., p. 124).

This patent was opposed on the ground that it was an imitation and infringement of the eosin patent, and no Letters Patent have yet been granted. It is, therefore, unnecessary to enter into any consideration of objections that might be raised to the claim made. The increase in sensitiveness resulting from the presence of a soluble silver salt together with the dye was, however, known in this country before the date of specification.

APPARATUS FOR THE PRODUCTION OF GRADUATED STRIPS FOR PURPOSES OF ACTINOMETRY.

BY D. WINSTANLEY.

The production of the graduated strip or ladder of tints is the fundamental problem of quantitative actinometry when the reduction of the salts of silver on papers prepared therewith constitutes the basis of the method used. I was familiar with Roscoe's pendulum apparatus, as originally devised and used, in or about the year 1862. My objections to the appliance in question are now, and were then, its cumbrousness, its weight, and the not necessarily obvious mathematical relations of a swinging pendulum. I have already described in one or other of the photographic journals other appliances which I have myself devised for the production of graduated strips, appliances which were portable, and the mathematical relations of one of which, at any rate, were obvious enough to all who read my articles on the subject. Many of your readers will remember the weekly diagrams of the total quantity of daylight which I published in these pages in the latter months of 1875—the first ones, certainly, which were ever published, and I believe the only ones which have been published yet. For the production of the data on which these diagrams were based, the scale of tints was absolutely indispensable; and the appliances I had previously devised, and which I have already publicly described, were resorted to in their turns and the order of their evolution. To produce these scales they were all, however, eventually superseded by the apparatus to which I invite the attention of your readers now. The instrument itself I carried with me to Paris in 1878, and as I then expected shortly to return I did not bring it back on my return to England in 1879. I must, therefore, speak of its proportions from memory alone. I shall not, however, be far from the mark in anything I say, and I shall not deviate essentially from the theory of the instrument at all. In the first place I took a thin rectangular sheet of "tin" measuring nine inches by eight, and scratched a line along its centre parallel with its longer sides. About this line as a vertical I then scratched out a triangle, or rather, a trapesium, whose base and apex were each distant an inch and a half from the shorter sides, and which measured, therefore, six inches in the perpendicular. The base was an inch in width, and the apex was one-tenth. This I scratched with the greatest nicety, and then cut out the space enclosed, using a hammer and chisel for the cutting, but taking care to keep within the lines, which were subsequently reached exactly with a file. This done, a tinman who laboured under my constant supervision was entrusted with the completion of the work. He bent the sheet into a cylinder with the triangular aperture longitudinally disposed. A cap was then soldered on one end, and a movable one fitted tightly on the other. Through the centre of the permanent cap a wire one-eighth of an inch in diameter, bent at right angles, and projecting an inch inside, was firmly soldered in, as shown in fig. 2. A second cylinder then was made a fifth of an inch smaller in diameter than the first, and also somewhat less in length. This cylinder was also provided with a pair of caps, one firmly soldered in, and the other one fitting tightly on, but movable, as in the instance of cylinder No. 1. The moveable cap was perforated in its centre with a hole large enough to take the wire projecting into the interior of the larger cylinder, and the fixed cap had a winch or handle soldered in its centre about the stem of which the loose cap of the larger cylinder had play. A wooden stand having two upright pieces was then made. In one of these a vertical hole was pierced for the reception of the upright wire seen in fig. 2, and on the other was affixed a strip of brass two inches wide, having a slot cut out for the reception of the horizontal portion of the handle wire, which, when *in situ*, was retained so by the movable and fixable piece of brass seen projecting on the right in fig. 4. The instrument was then complete. Its weight was very little above a pound, and it occupied only a small space in my portmanteau.

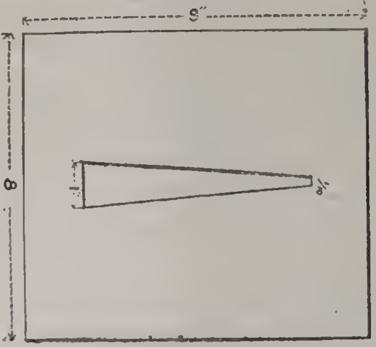

FIG. 1.

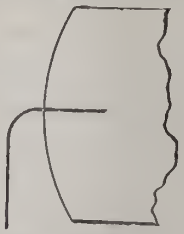

FIG. 2.

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Rolls of standard paper preserved by methods yet to be described were kept in the smaller cylinder, which of course was dark, having no triangular aperture cut from out its side.

When a strip was wanted, a piece of this sensitised paper was affixed in the "dark" room tightly round the external surface of the cylinder, care being taken that the part on which the strip would have to be produced should be on the handle or (as seen in fig. 3) on the downward side. This cylinder was then introduced within the larger one, the hole in the movable cap of the former receiving the spike of the permanent cap of the latter. The movable cap of the larger cylinder was then fitted in its place, the vertical wire in fig. 2 being inserted in the perpendicular hole provided for it in one of the uprights of the stand, whilst the horizontal handle portion was fitted and secured in the slot, as shown in fig. 4, when the whole affair presented the appearance seen in fig. 5. I ought to mention that the triangular aperture in the outer cylinder was on its upper surface. It will be seen that the outer cylinder was

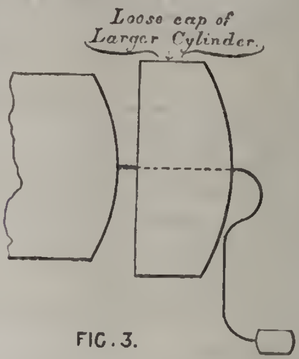

FIG. 3.

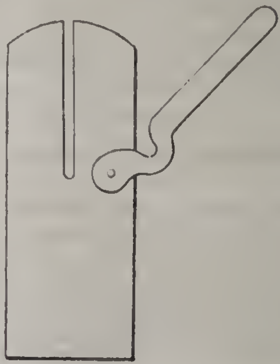

FIG. 4.

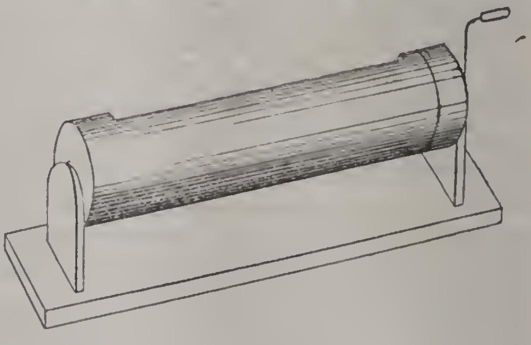

FIG. 5.

immovable when fixed upon the stand, and that the inner one could be revolved by means of the projecting handle. A fresh piece of paper of the standard tint was pasted on the outside of the outer cylinder at the edge of the triangular opening cut therefrom, and at its central part. The whole thing then was brought from the dark room with the handle and the sensitive surface of the paper downwards, and in the diffused light of day the inner cylinder was rapidly revolved until the sensitised paper assumed in the centre of its length the standard tint placed for the purpose of comparison—as nearly, at any rate, as in the circumstances of the case the eye could tell. During the rotation the handle was pressed inwards, the rotation carried on as uniformly as might be, and terminated as it begun with the handle downwards, leaving the strip produced by consequence in the dark.

It will be seen that the value of any portion of the scale of tints which was so obtained was directly in proportion to the width of that portion of the triangular aperture which had passed over it, and by which the amount of its exposure was determined. In use I found it convenient to expose the instrument to a diffused light which required about five minutes to print the strip, as this gave time for the eye to distinguish when the exposure was complete.

Of course a clockwork mechanism regulated by a "fly" is preferable to the handle for revolving the inner cylinder, and theoretically the aperture of the outer cylinder should be covered by a shield having a slit with parallel sides running from end to end. It was, however, with the instrument as I have described it, that my strips were made (and very beautiful things they were) which were used as the foundations of my diagrams of the total quantity of daylight, published in this journal in 1875.

The subject is one to which I shall probably return when I can lay my hand upon the manuscripts which relate thereto, but which have got into a state of almost inextricable confusion at the hands of the females of my family during my several years' absence from home on the Continent and elsewhere.

THE PERMANENCE OF PHOTOGRAPHIC PRINTS.

BY HERBERT STARNES *

I have received several very kind invitations from our friend Mr. Senier to attend one of your meetings, and have a chat with you on some photographic subject. I was afraid that none of the subjects that I have been working at lately would be of much general interest, but he thought that the question of the probable permanence of photographic prints done by the various printing processes in common use at the present day would be interesting. Anyhow I hope it will lead to a useful discussion afterwards.

The position of the photographic amateur of the present day about to decide upon the best printing process for him to use is something like that of a young man I met the other day in a photographic dealer's shop: he had come up from the country to get all the necessaries to set up as an amateur photographer. In his bag he had got catalogues and price lists from (I should think) every shop in London. The poor fellow had spent hours in studying these books, and was evidently fast qualifying for the post of inmate to a lunatic asylum, when, as he told me, his mamma suggested that he should run up to London, and see the cameras, &c., and he would be able to judge then which was best. He had come up, and when I met him he had been to three or four shops, the owners of which had each explained the advantages of using the only perfect camera in the world, and had advised him (as a disinterested friend) not to have anything to do with any of the rubbish generally met with. Need I say that the poor fellow was in a bigger fog than ever?

So it is, if an amateur seeks advice as to what printing process to use. An old photographer would probably tell him that if he wants quality, he must print on albumenised paper; that he himself had been working at it for the past thirty years, and ought to know something about it by this time. So he ought, but somehow some of them don't. The Platinotype Company's people would not be able to understand how anyone but a born idiot could think for one moment of printing in anything but platinum. If the said amateur were to wander into Soho Square, at 13 he would be informed that if he wanted anything simple, effective, and profitable, he must use the Eastman Permanent Bromide Paper; whereas if he called on Messrs. Marion, at 23, they would advise him to use the Britannia—No, I beg pardon, they might think they had got a better brand than that in stock now, or at least something they would prefer to recommend. Then if he got down as far as Richmond or Kingston, he might almost get to think that those London fellows had been trying to take advantage of his innocence.

Well, gentlemen, I will now tell you, as a photographic amateur, and I believe unprejudiced on the subject, how to my mind the rival claims of these different processes appear to stand as regards their practical use to the professional as well as the amateur photographer, and then we will go into the question of probable comparative permanence.

First, as to ease of working. With the professional, a printing-out process is probably as expeditious as any other, because a large number of negatives can be printed from at one time. Platinum prints more rapidly, but then one cannot attend to so many frames at once; besides, with the less the exposures required (especially with the ever-changing strength of daylight) the more the prints are liable to get overprinted; but with most amateurs the trouble of printing is due to it having to be done in daytime. For such, the bromide paper is just the thing, because it can not only be done of an evening, but there is the interest attaching to the development, which I consider the most interesting part of photography.

The next subject is, certainty of result. And I must say that I do not believe that any process will displace the albumenised paper print in the professional's printing room unless it enables him to see the result during the printing. With his work there must be no uncertainty or waste. With the amateur, however, the question is rather different, because he has not the experience of the professional printer to enable him to take advantage of the means of dodging a negative which a printing-out process allows.

If you will allow me, I will just show some of the amateurs present a few methods how a print can be improved after being taken from a printing frame. First, as to printing-in clouds. The greatest mistake photographers, as a rule, make is to overcloud their prints, and so detract from the interest of the landscape. If you have large masses of white clouds in your picture, with well-defined forms, they will attract the eye more than anything. All that is required is a suggestion of clouds to act as a background to the landscape, and to carry a scale of tones through the picture.

Other ways of improving a print are when there are two subjects of equal brightness, or if there is any bright light near the edges of the pictures, such as a pathway, by just tinting it, the picture will be much improved. With the aid of a clean duster to screen parts of the print from the light, a picture can be worked-up by tinting the lights and deepening the half tones and shadows, which would have been quite useless as it left the printing frame; and it is as interesting as working-up a picture with a brush.

It is the inability to do this, that to my mind is the great drawback to platinum printing. Indeed, I think it is almost safer to trust to time exposures by an artificial light of known power with the bromide paper, than to have to depend on a chance exposure to varying daylight with platinum.

I think you will agree with me that a charm of a picture depends very much on these delicate half-tints. Understand me, I am quite aware that platinum is capable of producing these tints in a most marvellous manner, the present Exhibition in Pall Mall proving this most conclusively; but how often do we see a print which would have been improved by a little dodging, if one could only have seen what was necessary during printing.

As to printing on bromide paper, I am inclined to think that in time it will take the place of the platinum, because it has not the curse of the latter in having to be so carefully kept from the damp. Besides, I am in hopes that soon we shall be able to so control the action of the developer as to be able to build up the picture to what we require during the development. There is a great deal of experimental work to be done in this direction. Only last week I coated some paper for the purpose of taking this subject up again.

I will tell you what I am driving at. I want to be able to

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* Read before the North Surrey Photographic Society.

take a fully-exposed bromide print, and do with my developer something like what an artist does with his colours—viz., build up the picture to my own liking, and be able to stop the action of development at any part of the picture, while a shadow required to be deepened, or more detail brought out in another. I do not think this is a wild, idle dream. Some time ago I was working in this direction with, I think, some hopes of success. On these plates you will see that although the whole of the plate had the same exposure, I controlled the action of the developer over the different portions, and in one case prevented the action of the developer at all on the darkest part of the picture.

I hope, soon, to have time to work at this subject again, and if we can control the development of our prints, we shall then be able to dispense with the advantages at present given us by the prolonged exposures of the printing-out process.

And now for the question of permanence ; but mind you, if we could not get good results with platinum or bromide of silver, I would prefer to keep to our old friend, albumenised paper. I would rather have a print I could admire for a few years, than be troubled with an eyesore for a lifetime. Some time ago you may remember a discussion took place in the columns of the *British Journal of Photography* as to the correctness of the manufacturers of the Eastman Bromide Paper in calling it permanent ; and as I was trying experiments with different formulæ of bromide of silver for paper work, I thought I would put prints by different processes to the same test. I first thought of getting samples of the different papers and printing all from one negative. But then I decided that it would not be fair to judge any process with which I had had no experience, by prints of my own preparation. I therefore obtained prints on Alpha, Argentotype, Eastman, and Platinum papers, done either by the manufacturers or their acknowledged agents. I also obtained a number of prints on fresh and ready sensitised albumenised paper, and some bromide of silver prints of my own preparation with different proportions of silver bromide and gelatine.

These were all put in a sealed bottle with a sponge filled with water, and sulphuretted hydrogen was passed into it for nine days. I am sorry now that I did not keep them all, but as I only did it for my own information I have only a few of the pieces on this card which I kept for reference, but there are enough for you to see the characteristic result from each process.

There are other destructive tests besides sulphuretting compounds which I have applied to these prints, oxidising agents, such as permanganate of potash, the effect of which you will see. Of course with such a test as chromic acid, platinum was the only one which could stand it.

And now, to conclude, I must say that I was thoroughly staggered with the Eastman paper prints. When we think that they had been subjected for nine days to a humid atmosphere of sulphuretted hydrogen, which practically destroyed the albumen prints, yellowed the whites of the platinum prints, and changed the bromide and others as you see, I am sure that you will agree with me that the colour of the image on the Eastman paper has actually improved, without any loss of density, and the whites have not yellowed. These two latter points are most surprising.

Some of Monckhoven's enamelled double transfer paper was tested at the same time, and had yellowed slightly.

I feel convinced that there is some secret in the preparation of the Eastman paper that gives it a permanence which I, for one, cannot obtain with bromide of silver alone, to say nothing of the beautiful rich black image so characteristic of an untouched Eastman print.

I need hardly say that I have no interest whatever in any of these processes. I simply show you these results of my experiments, and leave you to judge for yourselves.

Notes.

The parting dinner given on Saturday last to W. S. Bird, treasurer of the Photographic Society, was characterized by the most hearty good feeling, the forty to fifty persons present being mostly those who have worked side by side with Mr. Bird in connection with the Photographic Society. It is notable that when the chairman introduced a political toast, a portion of the diners slipped out of the room ; but they returned shortly.

Mr. Bird is now on his way to Australia, but is expected to return within twelve months ; H. H. Addenbrooke taking duty meanwhile at the exchequer of the Photographic Society.

There was something droll about the President's lament at this dinner over the fact that the Photographic Society is ignored by the Royal Academy, and never honoured by a ticket for the private view. Those who do not know what the Royal Academy management is like may think an intentional slight has been cast upon photography, but this would be doing an injustice to Burlington House. The truth is, the executive of the R.A.'s is about thirty years behind the age, and is likely to remain in its present impervious fossilised condition for some years to come. It has not yet woke up to the knowledge that there are other daily papers besides the *Times* and *Observer*, and invitations to the banquet are consequently only sent to those two journals. Hence it is quite likely it is not aware of the existence of the Photographic Society.

As to the arrangements for private view tickets, they are as immutable as the laws of the Medes and Persians. If the executive has decreed that a certain number of tickets shall only be distributed, no power on earth can make it alter its mind. Even illustrated newspapers are refused an additional ticket for the use of an artist, if one ticket for the critic is considered by the authorities to be enough. Papers which want to illustrate as well as criticise, are obliged to send one man on the press day, and the other on the private view day ; for by some unaccountable generosity the ticket is available on both occasions. But woe to the unfortunate man who on the second day ventures to ask for another catalogue. The gorgeously arrayed official who stands at the turnstile severely remarks, after looking at the snipped corner, "You have had a catalogue already with this ticket." And when the visitor explains and offers to purchase a catalogue, he is told grudgingly, "You can have another this time"—as much as to say, "Don't let it occur again." It is, perhaps, rather late in the day to find fault with the Academy arrangements, and we only mention these instances of peculiar management to account for the way in which the Photographic Society has been left out in the cold. The neglect certainly shows a want of gratitude, considering what use is made of photography by so many of the Academy exhibitors.

Photography has scored again, and this time has been the happy medium not only of conveying pleasure to the Queen herself, but serenity and happiness to the soul of a whole Board of Guardians! Indeed, we say this emphatically, in spite of the arbitrary declaration that "a Board has neither soul to be saved nor body to be kicked." On Jubilee Day the Preston Guardians, with a daring disregard of conventionality which cannot be too much approved, determined to send the Queen, not the usual illuminated address on a roll of parchment, but a bouquet of choice red roses, the roses of Lancaster. The roses were duly sent and as duly received, but, unfortunately, without an accompanying label or inscription. Consequently her Majesty could not tell to whom she was indebted for so charming a floral tribute; and as no one attached to the Court could have guessed that such a bouquet could have come from a Board of Guardians, it is not strange that the pretty gift was unacknowledged; but it was placed in a position of honour, and even figured at the Westminster Abbey ceremony. As month after month passed away, and no word reached the Guardians, it was resolved to send a photograph of the bouquet, which had been taken before its dispatch, to Sir H. Ponsonby; the photograph being intended to act as a gentle reminder. This hint proved perfectly successful, for, possessed of the photograph, it was easy to trace and identify the Preston tribute of roses, and on the 28th ult. the Clerk to the Preston Guardians had the satisfaction of reading to a full meeting of the Board, the Queen's gracious thanks for the much admired present, together with an explanation as to why the thanks had been so long delayed. The moral is to photograph important things before sending them away, and the story shows that Boards of Guardians are not always as "wooden-headed" as they are painted.

Artists who have been accustomed to draw on wood, fight hard against photographic reproduction. We heard the other day of a well-known man who, when asked to do a drawing on card, replied, "Yes, I will do it, but I must charge you half as much again as I should if I were to make the drawing on wood." He was so accustomed to leave so much to the engraver that the drawing on card, where every line would be reproduced, would take him about as twice as long as the drawing on wood. It is a well known fact that the "wood men" find at first a great difficulty in drawing for photographic reproduction. They have to exercise so much care, knowing full well there is no engraver to make good their deficiencies, that the task is very irksome.

At the same time artists of established reputation find that drawing on card pays, because the original drawing often fetches much more than the price paid in the first instance. Some artists are, however, rather chary of allowing their original work to get into the markets, for the reason that when they are sought after, every scrap will be enhanced in value.

The story goes that one artist, not unknown to fame, in his anxiety not to make himself "cheap," descended to a "mistake" which, if it were not a mistake, was not altogether creditable. A friend, who was anxious to have some of his work, commissioned him to do half-a-dozen drawings. The artist did them, but did them *on wood*, which, of course, was not at all what the buyer wanted. The artist explained he did not understand they were to be on card, but as the friend was not connected with the publishing world, it was not likely, though he may not have explicitely stated it, he would want them on wood. Anyway, it is very clear that the artist in question has an excellent idea of the value of drawings on card.

Dr. Heurck, a photo-micrographer, whose work was rather sharply criticised some time ago at the Microscopical Society as he had painted out the backgrounds, has sent another series of the same photographs with the backgrounds left in, to show that he had not in any way falsified the reproductions. Dr. Heurck seems to have been rather aggrieved at the remarks made, but it is difficult to see why, since he has only himself to blame. Mr. J. Mayall and Mr. Beck were quite justified in the remarks they made, and Dr. Heurck, by sending a second series of untouched photographs, has virtually conceded the point.

Short, but on the whole appreciative, is the notice of the Photographic Exhibition which appears in the *Magazine of Art*. It is as follows:—"The Photographic Exhibition.—The methods and processes of producing pictures by the action of light on a sensitive plate have undergone an immense improvement of late years. The old-fashioned photograph invariably suffered from a certain hardness of tone as well as exaggeration in the lights and shadows, and generally failed to do more than remotely suggest what it attempted to represent. But all this is changed now, and if any doubt were entertained as to the good work which is being done by photography, a visit to the Exhibition of the Photographic Society, now open in Pall Mall, would dispel it at once. This exhibition contains about six hundred photographs, some of them quite excellent, though it must be confessed that when so many specimens of the art are massed together they appear somewhat monotonous. The least satisfactory portion of the collection are the portraits of living personages, which are almost invariably stiff and crude. The landscapes, on the other hand, are, generally speaking, of great artistic merit; perhaps the best is Dr. Emerson's platinotype, "The Poacher," which emphatically recalls a picture of Millet's. Mr. Harry Tolley's series, too, is admirable, "On the Lonely Shore," which has obtained a medal, being the best. At the present time, when we are being told that photogravure is driving engravings out of the field, great interest attaches to the reproduction of pictures by Messrs. Boussod, Valadon, and Company, the Autotype Company, and Messrs. Henry Dixon and Sons. Of course it cannot be said that these have the artistic quality of mezzotints or etchings, but as cheap representations of work of art they are in every way praiseworthy."

Amateur photographers, and more especially beginners, are rather in force now at Brighton; perhaps one reason being that a local professional, C. H. Lewis, of 60, Lansdown Street, makes arrangements for instruction and help to beginners. All through the winter season there is excellent scope for camera work at Brighton.

No date has yet been fixed for a paper to be read before the Society of Arts by Sir Howard Grubb on Telescopes for Stellar Photography, but Walter Crane's Lectures on the Decoration and Illustration of Books will be delivered on the evenings of April 9th, 16th, and 23rd, 1888. John Mayall, junr., will continue his recent course of discourses on The Microscope, the dates being February 27th and March 5th.

The Society of Arts now numbers between three and four thousand members, the annual subscription being two guineas, or a life subscription of twenty guineas may be paid. Members are entitled to be present at the evening meetings of the Society, and to introduce two visitors at such meetings; to vote at all general meetings; to be present at the Cantor and other lectures; to have personal free admissions to all exhibitions held by the Society at its house in the Adelphi; to be present at all the Society's evening gatherings; to receive a copy of the weekly *Journal* published by the Society; and to the use of the library and reading room.

Perhaps no scientific society in Great Britain has been so thoroughly catholic in its aims and actions as the Society of Arts during the past few years; and the frequency with which we have availed ourselves of matter first published in its house, affords some indication that progress in photography has not escaped the vigilance of the staff at John Street, Adelphi.

◆

THE PHOTOGRAPHIC EXHIBITION.

(Free Criticism by the Public.)

Dissatisfied Person (*on entering*). Oh, I say, you know, it's not the least use trying to look at more than half the things. Not a bit of good hanging a photograph higher than a foot above the level of your eye unless it's a very big one—I mean the photograph, not the eye. Seems to me most of the big things are on the line. Anyway, there's an awful lot of little ones skyed. Perhaps they were not thought good enough to be looked at.

Placid Lady (*determined to be pleased with everything*). Oh, but they wouldn't have been hung if they were not meant to be seen.

D. P. Then why don't they provide a pair of carpeted steps, the same as at the Institute? Now I fancy "Home Groups," by Henry Stephens, would be worth looking at; but, where it is, who can say whether it's good or bad?

P. L Well, there's Lord Muncaster (No. 36), and Mrs. Evans (No. 37), they've got nice places.

D. P. (*indifferently*) I dare say. Good likenesses, probably, but who wants to look at them?

P. L. That's true. But, tell me, what do you think of these four: "Home, Sweet Home," "The Finishing Touch," "The Boat Builder," and that one with the quotation from Tam o' Shanter underneath?

D. P. Humph! Where's the man's right foot in "Home, Sweet Home?" Apparently hasn't got one. Whoever saw a baby muffled up like that? Why isn't the head shown?

P. L. Of course. Photographer isn't married, perhaps, or he'd have shown the head. And all babies kick when they're danced in the air, don't they? That one has no feet?

D. P. Takes after its father, perhaps. Don't care about "The Finishing Touch"—inane, I call it. "The Boat Builder" is the best. Don't believe a Scotchman who'd been "fou for weeks together" would look so sober as that gentleman, who has got his shawl so neatly arranged. And, good heavens! they're drinking *beer*. Where's the whiskey bottle?

P. L. Well, I think it's very nice, because Mr. Sawyer might have made them rolling in the street. I think they've got tipsy in a most gentlemanly manner. What a pretty picture is No. 40. What is it? Oh, "Carolling," by H. P. Robinson!

D. P. And without a sun bonnet in it! Come, that's something. Perhaps they're all worn out. Yes, it's deuced clever, and as good as anything in the show. Jolly sheep, aren't they? (*Looking at catalogue.*) No. 50, "Models from Model Dwellings," M. Nisbet. That sounds quaint. Confound it! hung too high again.

P. L. And a good thing, too. A lot of poor, ugly children. Not a bit interesting.

D. P. Nonsense. They're bits of real nature, so far as I can make them out. I detest your photographic "studies" and attempts to make pictures. They're nearly always obviously and horribly artificial.

P. L. How dreadfully difficult you are to please. Come, now, are not those bits of cottage life by Davison capital?

D. P. Yes, they're excellent, but I should like to know why old women with brooms invariably go with cottages. I suppose it's all right, but I must say I'm rather sick of that tiresome old woman.

P. L. Oh, fancy! there's someone been trying to do a "Christian Martyr." That's too funny.

D. P. Yes. But, thank goodness, it's skyed—where a martyr would expect to be, no doubt.

P. L. Here are some of the Cellerier Syndicate's pictures there's been such a fuss about. They're photographs in natural colours, you know.

D. P. Pity they haven't got a little more natural pose. Look at that unfortunate Alderman Tyler clutching that book. He's just going to throw it at another alderman, depend upon it. By the way, there's a lot more of these Celleriers a little farther on. We'd better get them over in one batch. (*Examines Nos.* 170 *to* 175.)

P. L. (*reading*) No. 173, "Mr. F. A. Walker, A.H.A., Boston, Mass." What a lovely uniform! and see, he carries his hat and his gloves in his hand.

D. P. Yes, and he's walking on a desolate rocky shore. Has taken off his hat to cool himself. No. 170 is another Walker, A.H.A., a colonel this time.

P. L. Yes, but it's the same rock. Why, there are no less than thirteen Celleriers, and all hung on the line, too.

D. P. Pity they didn't draw the line at twelve of the Celleriers. I should have been quite contented with one. Let's go back to No. 91, "Preparing for Boxing Night." One of the new photographs taken on the stage, I suppose. Oh, here it is. Eh?—what—ugly old washerwoman ironing unknown garment, clown's pantaloons hung on line to show there's no mistake about the title of the picture, young lady—no relation, can't be, to washerwoman—trying property hung on smaller girl, clown presumably resting after the labour of painting the property poker. Thought the property man always prepared the poker.

P. L. What's that written on the pot in the corner? Oh, "red paint," I suppose it's meant for.

D. P. That's to show there's no deception, and that he really has painted the poker the proper colour. Let us look at something else. Now here's originality for you (*stops opposite No.* 102, "*Panel Portraits,*" *Warwick Brooks.*) Landscape and portraits mixed up after the fashion the American magazines are so fond of.

P. L. Yes, but which is one expected to admire?

D. P. Whichever you please. If you don't like the landscape, try the portrait, and *vice versa*. That's the advantage of the pictorial patchwork style.

P. L. Whoever is this—Romeo? No. 124.

D. P. Gentleman in Fancy Dress. Seems to have a fancy face, too, for I never saw one like it out of a waxwork show. Why, he must have had all the lines ironed out.

P. L. It certainly has the appearance of a wax figure, especially about one of the legs.

D. P. Want's re-stuffing. About half the size it ought to be.

P. L. Well, but it must be like, or the camera wouldn't have taken it that way.

D. P. Oh, I suppose so. I can't explain why the leg looks so queer. That seems a comical picture near the ground. (*Goes down on his knees.*) Well, of all the funny things—why it's Miss Biffin with a dragon's tail tied on to her.

P. L. Ridiculous. Can't you see what you call a dragon's body is a court train. The lady, I admit, does look all body. I wonder why all those dogs' heads were hung there. So dreadfully big.

D. P. Exactly, but not so dreadful as No. 145, "Portraits taken direct." The hat that girl has on is simply a nightmare. The idea of putting heads a little larger than life on the line! That old gentleman's nose will haunt me for a week. Ah, there are our old friends, Burnham Beeches. Exhibition wouldn't be complete without Burnham Beeches. Very nice, "School of Military Engineering," but why is the atmosphere so murky?

P. L. Do look at that "Portrait Study" (No. 158). I'm sure that lady must be very proud of her moles, or she wouldn't have had that side of her face taken.

D. P. And why not? Cromwell said, "Paint me with my warts," and why shouldn't the lady say "Photograph me with my moles?"

P. L. Well, it's more interesting than No. 160, "The Invalid." Gives me quite a headache. I cannot understand why photographers and painters choose such doleful subjects.

D. P. Oh, I can understand the photographer doing it. A person lying in bed is not very likely to move, you know. Here we are again. These "At Home Photographs" might be interesting if one could only see them. But the hangers, whoever they may be, are afraid to travel out of the groove, and so they put these three commonplace portraits by the same man on the line. Rather absurd, that old man with the flowers on the table, and obviously arranged to fall down.

P. L. But when you are photographed with flowers on the table they *must* be hanging down. It's the proper thing.

D. P. Oh, is it? No. 206, "The First Born," is better than "Preparing for Boxing Night." It's by the same man. What a number Vernon Heath has sent.

P. L. Yes; but why has he been photographing mountains? I hate mountains in photographs. They always look so much alike.

D. P. These pictures of J. Gale are more to your taste.

P. L. They're very beautiful. There's one of the old women you spoke about some time ago.

D. P. Yes; at the gate of the cottage in "Too wet for the woods to-day." Doesn't look wet, does it? Funny that photographers so often spoil these pictures by the titles they give them.

P. L. But Mr. Gale couldn't help saying something about the wet after giving the old woman an umbrella.

D. P. Oh, here are some more Brobdignagians, No. 283. Been awarded a medal, too. Very wonderful, I daresay, but I wish they were impossible. Imagine all your family hanging on your dining-room walls in this hard, adamantine style.

P. L. I must say they look mechanical. What a pity we can't see Leonor Blake's "Out-door Portraits," No. 326, a little better.

D. P. Too high, of course. Shall we look at the screens? There are so many show-case things on the walls we needn't stop to examine.

P. L. If you like. Oh, what does this mean—No. 469? Why should a girl holding up a picture frame be labelled "Meditation?"

D. P. That's a conundrum. I'll ask you another. Why should a girl holding up a picture frame be labelled "Expectation?" There you are—No. 487.

P. L. Oh, I give it up.

D. P. So do I. Bother it, here's another old woman—No. 492—"Darning." I cannot, will not, undertake to get up any interest in old ladies darning. Halloa, what's the meaning of 498? Most imprudent, I should say, of any young lady attired in only *one* garment to sit on the grass in the back garden and drag dogs out of a tub.

P. L. Anything but ladylike. I should have thought a macintosh would have been much more sensible with those nasty dogs splashing.

D. P. She seems an eccentric sort of young person. Here she is again, in the same one undergarment, and has just been playing, or is going to play, the guitar. I wish her foot and ancle were not so clumsy.

P. L. Oh, she's mad—must be. The idea of washing dogs and playing on the guitar in a——

D. P. "Reverie," it's called. These pictures of Sutcliffe are very clever.

P. L. Yes, exceedingly so. But let us look at the landscapes now. You won't be quite so dissatisfied, I think, with *them.*

D. P. I'm sure I shall not. They are a long way ahead of the figure pictures.

[*Left inspecting the landscapes.*]

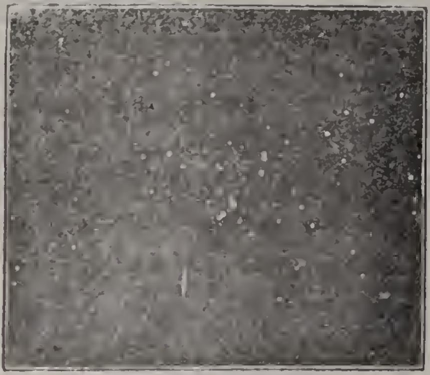
PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Chromo-Collotype Process of Albert and Hoesch—Photography of a Falling Star—National Science Exhibition, Wiesbaden—Ottomar Anschuetz' Stroboscopic Disc—Preparing Gelatine Emulsion.

Chromo-Collotype Process.—One of the latest inventions patented in this country is the chromo-collotype, or chromo-lichtdruck of F. L. Hösch, of Munich. As many of the readers will probably remember, the late Jos. Albert, of Munich, many years ago invented a similar process. He photographed a painting three times: the first negative was taken through a red-coloured glass plate, the next through a blue glass plate, and the last through a yellow glass plate. In this way he obtained three negatives, all of the same size, but in taking of which respectively the rays of the three primary colours—red, blue, and yellow—had been absorbed. From these negatives he secured three lichtdruck plates, one from each, the first of which he printed in red, the second in blue, the third in yellow, one over the other, and thereby he obtained more perfect pictures than could possibly be got by any other method. The Hösch process, though being also based on photography, is a different one. In this process a painting is photographed, and behind the resulting negative is exposed a lichtdruck plate. From this plate as many prints as colour plates are required for the finished picture are taken on well sized paper. The prints, or off-sets, are fixed to cardboard or to glass plates, and with specially prepared oil-colours painted grey in grey, then they are all photographed again. In the negatives thus obtained, the highest lights, and also the margins of the picture, which should print perfectly white, are backed, then lichtdruck plates are exposed behind the prepared negatives, which are washed, etched, and respectively printed in the colours yellow, red, flesh tint, and blue, one over the other. The advantages of this process are that a considerably smaller number of colour plates are sufficient for the reproduction of a painting than in the case of chromo-lithography, and that the finished pictures are much more perfect and of a greater softness than chromo-lithographic prints. On the other hand, more time is occupied by this process, and the printing and plates are more expensive.

Photography of Falling Stars.—Amongst the numerous applications of photography to scientific purposes, perhaps none has proved of such incalculable benefit to science generally as its universal adoption in connection with astronomical observations. To show the immense value of photography in this class of graphic work, the eminent Professor von Konkoly, of Budapest, has written a most comprehensive work, entitled "Die Himmelsphotographie," published by Wilh. Knapp, of Halle, in which he fully describes all optical appliances, and the progress that has been made during the last few



years in connection with celestial photography. Of the many illustrations contained in this important work, I have reproduced one, representing the photograph of a falling star. With regard to this photograph, the author says :—" One day E. von Gothard showed me a negative, on which, beneath the group of stars, was photographed a beautiful comet. The learned doctor, as soon as he perceived this phenomenon on his plate, at once communicated with the observatories at Vienna and Budapest, imagining the discovery of a new comet by the aid of photography. But no such object was to be found at or near the denoted region. When I received the plate from Gothard, and examined it under a weak microscope, I soon perceived the trace of a shining falling star." In my opinion, it would by no means be impossible to photograph falling stars, but having made many experiments in this direction, I may state that by far the most of the meteorites (more than 96 per cent.) are of a yellow colour, showing sometimes the yellow sodium light of the spectrum in dazzling brightness.

Natural Science Exhibition of Wiesbaden.—The sixtieth annual meeting of the German naturalists and doctors took place in the latter part of September at Wiesbaden. In the natural exhibition opened on this occasion, photography was also represented. The exhibition of the photographic department was a success both in regard to the quality of the exhibits and the number of exhibitors. Of the many interesting exhibits, the renowned optician, Zeiss, of Jena, showed a most ingeniously constructed large apparatus for photo-micrography, provided with electrical arc light, and an arrangement for the condensers to be cooled by water. This apparatus permits an enormous magnification of the object, amounting to 4,500 diameters. Astronomical photographs were shown by E. von Gothard, of Hereny (Hungary), and photographs of shining clouds by Dr. Stoltze, of Berlin.

Stroboscopic Disc.—The well-known photographer, Ottomar Anschütz, of Lissa, exhibited his splendid series of modern pictures, which were also represented by his new invented apparatus for stroboscopic combination. As in the well known ordinary stroboscopic disc, invented (almost simultaneously) in 1832 by Plateau, and by Stampfer, so in this apparatus, the successive series of pictures are arranged circularly upon a steel disc of large diameter. These pictures are diapositives of high finish, and a diameter of four inches. About eighteen of these are fixed to the disc in a vertical circle, and according to the motion to be represented. The disc can be made to rotate very rapidly around a horizontal axis. Perpendicularly over the centre of the vertical disc, and behind it, is placed a spirally-wound Geissler tube, with a circular opal glass disc of 4 inches diameter in front of it, which, at the moment when each picture finds itself directly in front of the opal glass disc, sends out, for one-thousandth to one two-thousandth of a second, a flashing and beautiful light, which after this short time at once disappears. If the disc is made to rotate fast enough, so as to let the pictures follow one another in periods of 0·03 seconds, then the opal glass disc begins to shine with a seemingly continuous light, and the different phases of motion join to a single continuously illuminated picture, so that the impression of the appearance is, in consequence of its great truthfulness, an exceedingly surprising and effective one. Very satisfactory photomicrographs were exhibited by Max Hauer of Oberhausen, Klonore and Muller of Berlin, Albert Knouf of Eichstaeof, Kuhl and Co. of Frankfort-on-Maine, by Dr. R. Neuhauss of Berlin, by the Royal Microscopical Society of London, and M. Stenglein of Berlin. Selle and Kuntze, of Potsdam, showed excellent portraits taken by magnesium light. Professor H. W. Vogel, and his son, E. Vogel, exhibited a collection of reproductions and landscape views taken on ordinary and orthochromatic plates. In the colour-sensitive plates, the distance, which with ordinary plates appeared so dim, stood out with astonishing clearness. These excellent photographs attracted much attention. Equally interesting were some photographs of the spectrum of the magnesium and the oxygen, taken on azalin plates, and a collection of enlargements, shown by E. Vogel.

Sresniewski's Gelatino Emulsion.—Professor Eder, in reviewing a new handbook of photography, written by a Russian dry plate manufacturer, M. Wiatcheslaus Sresniewski, describes a new method of preparing gelatine emulsion. It is a modification of Mr. Henderson's process, and consists in the following :—

No. 1.—	Potassium bromide	8 grammes
	Distilled water	20 c.c.
	Gelatine (Nelson's No. 1)	1 gramme
	Carbonate of ammonia	1 gramme
	Potassium iodide	0·2 „
No. 2.—	Nitrate of silver	10 grammes
	Distilled water	40 c.c.
	Nitric acid (10 per cent. solution) ...	2 drops
No. 3.—	Alcohol 95°	50 c.c.
	Ammonia	4 „

(Temperature 68° F.)

First add No. 2 to No. 1, then mix it slowly, and well shaking, with No. 3. The emulsion is kept for eight to ten hours in a room of the usual temperature. At last add a warm solution of—

Gelatine	18 grammes
Water	120 c.c.

and finish by precipitating with alcohol, or by setting and washing with water.

Patent Intelligence.

Applications for Letters Patent.

14,859 William Rowland, 3, Fair Street, Stepney, E., for "A portable camera stand top."—Nov. 1, 1887.

15,153 Robert Overton, 21, Finsbury Pavement, for "An improved method of adjusting the front slides of photographic cameras."—Nov. 7, 1887.

Amended Specifications Published.

3879* of 1886 W. J. Lancaster for "Photographic cameras." Particulars of alteration will be found on p. 651.

Specifications Published.

16,327 John Urie, senr., and John Urie, junr., both of 83, Jamaica Street, Glasgow, Lanarkshire, Photographic Artists, for "Improvements in and connected with photography and the treatment of photographic prints or pictures."—Dated 13th December, 1886.

Text and diagrams next week.

16,476. Mary Walker and George Edward Walker, for "Process for producing from photographic and other designs engraved plates or rollers for printing."—December 15th, 1886.

The Patentee says :—

In our Specifications No. 13,609 of 1885, and 2,770 of 1887, we described means of producing copies for lithography from photographic or other designs. Our present invention relates to a process whereby the operations described in these Specifications are applied along with farther operations to the production of engraved plates or rollers for printing. For this purpose the pellicle produced, as described in the Specifications above referred to, consisting of a sheet of paper or a film of collodion, and having on it a layer consisting of a mixture of dextrine, starch, and kaolin, on which a tracing has been made with lithographic ink or crayons, is placed face downwards, and pressed on the plate or on the surface of the roller that is to be engraved. The body of the pellicle or film is then removed, leaving the lithographic ink or colour of the drawing on the plate or roller. On this is electroplated a metal which is less easily attacked by acid than the metal of the plate or the roller itself. Thus, if the plate or roller be of zinc, copper is electroplated on it ; if it be of copper, gold or platinum is electroplated on it. The metal thus deposited appears only on those parts of the surface which have none of the lithographic ink or colour. By applying a solvent, such as turpentine, or benzine, the lithographic ink or colour is removed, and the whole surface is then treated with acid, whereby the parts which had been occupied by the lithographic matter are etched to any desired depth, the rest of the surface formed by the less corrosible metal remaining unaffected by the acid.

Claim.—The herein described process for producing engraved plates or rollers for printing, by transferring to the surface to be engraved, the design lithographed on a film or pellicle, removing the body of the film or pellicle, leaving the ink or colour of the design, electroplating the surface, dissolving out the ink or colour of the design, and etching.

Official Abstracts of Accepted Complete Specifications.

14,931 of 1886. Burns. "Cameras [including lenses and lens fittings.]" Holding camera lenses in flexible elastic frames.

14,931 of 1886. Burns. Miscellaneous. For "Dark tent or bag" : coloured glass held in flexible elastic frames.

14,548 of 1886. Dessendier. "Photometers and actinometers" : Actinic power estimated by rapidity of combination of chlorine and hydrogen exposed to light ; special electrical apparatus."

Patent on which the Sixth Year's Renewal Fee of £10 has been paid.

4896 of 1881. J. Plener. "Photographic emulsions."

Correspondence.

PHOTOGRAPHIC LIBRARIES.

Dear Sir,—In your issue of last week you refer to the subject of photographic libraries, and as you do not mention the attempt of the Photographic Club to get together a library of books relating to the art, I fear that I shall be accused of dereliction of duty if I do not bring before you the fact that this Club is deeply interested in the subject, and that it already possesses a good number of books, many of them rare. The enclosed catalogue gives titles of books in the library at the beginning of the year, and important additions have since been made.

I may add that visitors wishing to consult any volume will be welcome to do so any Wednesday evening, between seven and ten ; and also that members have the privilege of borrowing books.—Yours faithfully,

Anderton's Hotel, E.C., Nov. 9th. Edgar Clifton.

[We are glad to find that the catalogue is such an extensive one, including many rare books.]

THE LATE I. H. JENNINGS.

Sir,—May I venture to use a portion of your space on behalf of the widow and child of your late contributor Mr. Isaac H. Jennings. The latter part of his life, which ended only a few days ago, was spent in great poverty and misery, and I fear frequently without even sufficiency of food, and this, too, not from any fault of his, but purely from misfortune. Your readers probably appreciated his clear terse style, and his evident knowledge of his subject, and I am able to speak for his attachment to and exertions in pursuit of more than one branch of science, specially photography, and the microscopic branch of our art.

The widow and child of the late Mr. Jennings are now in absolute poverty. I hope to be able to get the child admitted to an orphanage, and I beg to appeal to your benevolent readers to aid me in my endeavour to provide for the widow. In this appeal Dr. R. L. Maddox joins me. He or I will be most happy to receive any sums that the generous may be prompted to give for this good object, and I am sure you, too, will readily take charge of any gifts that may be forthcoming.

I never saw Mr. Jennings, but have corresponded with him for some months, and I have made every enquiry as to the genuineness of his case, so that I have no hesitation in interesting myself in the matter. I have already in hand a sum of money, the gift of a gentleman who has often been generous to photographers in trouble, but I fear the whole of this sum will have to be spent in providing for the child. We have still to provide for the lady who, to my knowledge, shared with Mr. Jennings all his sore distresses, and was to the last a devoted wife.

Dr. Maddox's address is Greenbank, Portswood, Southampton ; mine is Cromwell House, Bexley Heath, S.E. I hope I make this appeal not altogether in vain.—I am, sir, your obedient servant, Andrew Pringle.

Camera Club, 21, Bedford Street, W.C., Nov. 10.

Proceedings of Societies.

Photographic Society of Great Britain.

The first ordinary meeting for the winter session was held on Tuesday, the 8th inst., at the Gallery, 5a, Pall Mall East, James Glaisher, F.R.S., President, in the chair.

Minutes of the last ordinary meeting in June having been read and confirmed, the following were duly elected members of the Society :—Dr. E. W. Alabone, W. Mortimer Baylis, W. Boussod, J. J. Brigginshaw, G. W. Cabb, V. H. Chintanon, Lyonel Clark, Alfred Deed, Robert F. Dixon, W. R. Few, C. F. Fischer, M.D., W. W. S. Follet, G. E. Septimus Fryer, Herbert J. Gifford, A. J. L. Grimes (Calcutta), M. J. Harding (Shrewsbury), W. Hayes, B.A., Mrs. Brien Hodson (Wooton-under-Edge), E. D. Lavender (Bromley, Kent), J. E. Lezard, Henry Little (Twickenham). Rear-Admiral Maitland (Surrey), Gustav Mullins (Ryde), Paul Nadar (Paris), E. W. Parkes, W. Scorer (Havaut), H. Shier, F.G.S., Edward S. Shepherd, J. G. Sinclair (Hartlepool), W. Tomlinson, J. Watson (Llandaff), J. B. B. Wellington, J. Whittaker, Hon. Lewis S. Wingfield.

Medals were then presented by the Chairman to those exhibitors—or their representatives—whose work has gained for them the distinction of an award, the President, as is his usual custom, taking the opportunity of addressing congratulatory and encouraging remarks to each recipient. A list of medallists and the official catalogue number of the successful exhibits follow :—G. P. Cartland, No. 17 ; Harvey Tolley, 30 ; H. P. Robinson, 40 ; T. A. Green, 236 ; H. C. Pettitt, 267 ; J. F. Roberts, 268 ; W. J. Byrne, 283 ; Frederick Müller (Munich), 290 ; Andrew Pringle, 389 ; Boussod Valadon and Co., 394 ; P. H. Emerson, 402 ; Annau and Swan, 410 ; J. B. B. Wellington, 412 ; F. H. Evans, 452 ; F. M. Sutcliffe, 547 ; W. H. Hyslop, 635 ; Arundell and Marshall, 654 ; Eastman Dry Plate and Film Company, 687 ; J. Gale, 699 : total, nineteen medals.

Andrew Pringle, addressing the Chairman, said : Many of his friends were astonished at the quiet way he got over the work of photographing micro-organisms as he had done, but the truth was he could not have achieved so much had he not received great help from Dr. Maddox, who taught him by letter and personally.

The Chairman: I have known Dr. Maddox for many years as an expert microscopist, and I am sure, Mr. Pringle, you could not have found a better teacher.

W. H. Walker said he felt great pleasure in receiving a medal on behalf of the Eastman Company, but he desired to say that the examples sent over here were never intended for exhibition. The award would encourage the firm to do better in future, he was sure.

The Chairman then called special attention to Lezard and Co.'s Photochronoscopes (695), which the Judges wished they could have awarded a medal. They also desired to mention C. J. Collins' adjustable bamboo stand (646), and other exhibits. Also those of Watson and Son (663, 664), and Tylar's metal dark slides (657). For his own part he desired to mention the Aurora Camera of T. Samuels (638), T. S. and W. Taylor's lenses (713), W. W. Winter's direct picture entitled "My Mammy" (23). The work of W. Wainwright, junr., G. Davison, Warwick Brooks, H. S. Mendelssohn (H. Perigal, F.R.A.S), and W. F. Donkin, Hon. Sec. The Chairman then alluded to the labour involved in judging so many pictures, and called for votes of thanks to the judges of pictures and apparatus, and also the hanging committee.

Thanks having been accorded to the gentlemen who had acted in these capacities,

The Chairman said that the Exhibition would close on Monday, November 14th. Notwithstanding the wet weather, there had been 2,600 visitors to the Exhibition up to the present, and about £250 had been received. Last year the takings amounted to £271, but there were still several days to make up the deficiency, £19. He then announced that the next ordinary meeting would take place on the 13th proximo; technical meeting, 22nd inst., special meeting, 15th inst.

The proceedings then terminated.

Photographers' Benevolent Association.

The Committee met on 3rd inst. to consider the following case which had been brought forward at the previous meeting, and adjourned for inquiries.

Early on Tuesday morning, October 18th, the body of a man was found lying on the grass in Hyde Park. He was announced by Dr. Blackett to be dead. A letter was found upon him, the contents of which was as follows:—"My dear wife,—God the Almighty forgive me. Without work, diseased in mind and body, I am forced to give up my miserable life. He will protect my poor wife by good people's counsel and assistance. Farewell, dear Mary, till we meet again where there is no ill or sorrow.—M."

The wife was communicated with, who stated deceased had been well to do, and earned much money years ago as a photographic artist, but of late years trade had been bad, and his circumstances became worse and worse. This case was recommended by a donor under rule 4, which gave them the privilege of recommending for the consideration of the committee cases of non-members. The Secretary reported he had investigated the case, and found the widow perfectly destitute, and without any friends to assist her; they had been married thirty years; for the last year they had existed in a condition bordering on starvation, owing to want of any regular employment.

The committee, after careful consideration, granted the widow the sum of five pounds.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 3rd inst., at Masons' Hall Tavern, Coleman Street, W. H. Prestwich in the chair.

The Hon. Sec. announced the programme decided upon by the committee for the winter session. On the first Thursday of each month a paper will be given, followed by discussion. Papers have been promised by J. Traill Taylor, J. J. Briginshaw, Norman Macbeth, F. A. Bridge, E. Clifton, W. Cobb, W. M. Ashman, Hume Nesbit, W. H. Harrison, and J. W. Wharton. The last Thursday in each month has been reserved for lantern subjects. The annual dinner will take place in January, and one smoking concert will be given.

Phillip Everett, J. Jole, and W. Wallace were elected members of the Society.

Prints were shown by J. W. Wharton.

J. T. Taylor presumed the object of exhibiting prints was to elicit opinions as to the merits. He noticed, when holding one of these examples at arm's length, a mass of white, too pronounced, and suggested exposing that portion to daylight after printing, so as to tone it down a little.

Norman Macbeth said if the mass had been broken by the introduction of a figure, it would have been better pictorially.

J. T. Taylor also suggested where an improvement could be made in another of the prints, by shifting the position of the vertical line.

F. W. Cox asked Mr. Macbeth's opinion as to the best form of lens and focus to use out of doors with a half plate camera. The gentleman addressed preferred a rectilinear lens when used for objects twenty yards distant; if used nearer, there was a likelihood of distortion. He thought Dallmeyer's new lens might be better in this respect, as it included both a large angle and aperture.

F. A. Bridge said a lens of rectilinear type and eight and a half inches focus was suitable for half-plate size.

Norman Macbeth remarked that the only way in which short-focus lenses could be used for figures in landscapes was to take the figures separately, and print in afterwards. The use of long focus lenses was a remedy.

Other prints were shown, but there was no discussion on them.

The following question was then read:—"Capt. Abney, in his work, 'Photography with Emulsions,' makes the following assertion respecting the use of iodide of silver:—'I am in a position to say that an emulsion of silver bromo-iodide can be made just as sensitive as the emulsion of silver bromide as regards the ordinary so-called actinic rays, and can be prepared so as to be perfectly unacted upon by the orange or red rays, which is a step in the right direction according to my way of thinking.' Again, in the Photographic News Almanac for 1885, he writes as follows:—'Iodide in gelatine emulsions is the thing to give a negative all the qualities that are essential for it to be pronounced first-class.' How can this be reconciled with the claims made on behalf of orthochromatic plates, which are supposed to render the yellow, orange, and red more correctly, and to subdue the voilet and blue? Does the experience of members of this Society, so far as landscape work is concerned, agree with that of Capt. Abney?"

W. Cobb preferred silver iodide in an emulsion, and thought many others thoroughly agreed with Capt. Abney's statement.

W. M. Ashman spoke of the difference in colour of plates containing much iodide, and the properties conferred. These, however, he regarded as quite distinct from the characteristics found in plates stained with dyes orthochromatically. Some experimenters had found that plates containing iodide, when stained, behave similarly to pure bromide films stained.

W. Cobb remarked that B. J. Edwards was of opinion that either class of plate was suitable for staining, but adding the dye to the emulsion was preferable.

W. Wallace said there were two distinct points: one that iodide does not render the reds, &c.; and the other that orthochromatic plates are more suitable for red, &c. The question is whether for landscape work this is so or not.

The Chairman considered that Capt. Abney's version was correct, that "iodide is the thing."

W. Cobb regarded it as a preventative of halation, and there were many other advantages in favour of an iodide plate.

S. Medland thought the addition of a backing to any plate was the best preventative against halation.

F. A. Bridge found carbon tissue most useful as a backing; when soaked in water it was easily applied.

W. H. Harrison once met with halation in a plate backed with macintosh in optical contact. The test was a severe one, viz., a rope across the river Reaux. He used a Monckoven plate presumably containing iodide.

A. P. Higgins recommended backing sheets made of lamp black in glue and treacle. (See current Year-Book, page 208).

S. Medland drew attention to a transparency he believed to be on a "Beechey plate." Originally it was grey, but after three years' storage it had changed to pink. Mercurial intensification was suggested as a possible cause by several, but A. Cowan thought an organic silver chloride plate was used, and that it had been insufficiently washed.

J. T. Taylor asked for opinions regarding the special advantages of the plate boxes in virtue of which a medal has been awarded by the judges at the Pall Mall Exhibition. The boxes, he said, had metal grooves covered with paper. Many thought it a mistake to use paper in contact with sensitized plates. Again, the paper must be cemented to the divisions by some means or other, and another suspicious element was thereby introduced.

W. Cobb regarded the interleaving of plates with paper as deleterious unless quite dry, and afterwards kept so.

H. M. Hastings considered square grooves to be a mistake; V-shaped divisions were very much better.

F. A. Bridge recently developed two 10 by 12 plates which had been packed with tissue paper between for the last three years, and there was not the slightest mark indicating where the paper had been.

The responsibility of plate makers for defective negatives then afforded matter for discussion, which became general. No definite decision was arrived at; the inference was, however, that good plates may be made to produce bad negatives by an unsuitable development; therefore the plate makers are not liable for the loss. But for mechanical defects they were. In one case referred to by C. H. Cooke, upon opening a box of plates several of the films were more than half detached from the glass.

Camera Club.

On November 3rd, an address, accompanied by a demonstration, on "Intensification of Gelatine Negatives with Mercury, followed by Schlippe's Salt," was given by W. E. Debenham. Francis Cobb occupied the chair. The demonstration proved most interesting to those present, and several comparative experiments were shown by Mr. Debenham. The gradations of increased intensity obtainable by the method, and the easy means of reducing by hypo any excessive treatment of the plate with the iodide of mercury, were well illustrated. The only doubt which arose was as to whether the treatment left the film of the plate and the shadows of the negative stained. This appeared to be the case slightly in one case, though inappreciable in all others, the stain possibly arising from imperfect washing prior to intensification. Some discussion and conversation ensued, Lyonel Clark making interesting and useful comments upon the subject, and the members and friends present then gave Mr. Debenham very hearty thanks for his practical illustration of so useful an intensification method.

Thursday, November 17th, is a lantern evening, when slides will be shown by Messrs. Newman (Swiss views), Fison (Norwegian views), C. B. Wright (Norwegian views), and Evans (Exeter Cathedral views), and by other gentlemen.

On November 24th the subject will be "Enlarging," paper by D. P. Rodgers.

North London Photographic Society.

The annual general meeting took place on November 1, at Myddelton Hall, J. Traill Taylor in the chair.

The Hon. Secretary, Mr. H. M. Smith, read the annual report, of which the following is an abstract:—

The Society now numbers eighty-nine members, including eight honorary members, who, being members of the original North London Association, which ceased to exist in 1869, were recommended by your Council for election. The meetings of the Society have been well attended, the average number present being thirty-six. During the year lectures and demonstrations have been given. Well-attended outdoor meetings have been held every Saturday during the summer season, and on the various Bank holidays. On some of these occasions opportunity has been taken to join with other societies, and this Society was well represented at the outdoor meeting of the Photographic Societies of London held at Watford on the Queen's Jubilee day. In consequence of the appreciation of the lantern exhibitions held during the early months of the year, your Council have acquired a good optical lantern, which they trust will induce more members to devote attention to the production of lantern transparencies. Many of the difficulties incidental to the practice of this branch of the art have been removed by the introduction of suitable commercial plates and modifications in development; and the suitability and simplicity of the collodio-bromide emulsion process for this purpose have been amply demonstrated at the meetings. The question-box has been in constant requisition, and many interesting and profitable discussions have resulted therefrom. Questions on almost every point in photography have been dealt with, and much valuable information elicited.

The Auditors' report showed a balance in hand of £8 3s. 8d.

The following officers were elected for the ensuing year:—

President—J. Traill Taylor.

Vice-Presidents—A. Mackie and E. Clifton.

Curator—E. Traill Hiscock.

Council—F. W. Cox, W. Few, J. Humphries, J. Jackson, L. Medland, J. Nesbit, J. Oakley, and F. G. Reader.

Hon. Secretary and Treasurer—H. M. Smith.

It was resolved to alter Rule 11, to enable nine members to call a special meeting of the Society instead of twelve, as previously. It was also decided to alter Rule 13, to prevent any member whose subscription was unpaid three months after application from voting upon any subject connected with the management of the Society. The next meeting of the Society will take place on November 15, when F. W. Cox will deliver a lecture on "The Platinotype Process." Visitors are invited.

Bolton Photographic Society.

The annual meeting of the above Society was held at the Baths, Bridgman Street, on November 3rd.

The Hon. Treasurer, C. K. Dalton, produced his accounts, which showed a decent balance to carry forward. The following gentlemen were elected as officers:—

President—J. R. Birdson.

Vice-Presidents—R. Harwood, E. N. Ashworth, T. Parkinson, J. W. Hawksworth, J. W. Cundey, M.A., W. Knowles.

Hon. Treasurer—C. K. Dalton.

Hon. Sec.—B. H. Abbott, 12, Corporation Street, Bolton.

Council—J. Boothroyd, J. Leach, R. Mercer, J. Lomax, Thos. Davis, W. Laithwaite.

The Secretary then read the annual report, which was approved.

W. Laithwaite exhibited one of Newman's patent diaphragmatic time shutters.

The Secretary exhibited one of R. Thomas' (of Luckstns) simplex changing box and dark slide combined.

There was a lantern exhibited by W. Boothroyd, and J. Boothroyd showed some ninety slides he had made.

Edinburgh Photographic Society.

The twenty-eighth annual meeting was held in 20, George Street, on the 2nd of November, the President in the chair.

Ten gentlemen were balloted for as ordinary members, and five names submitted in nomination for election in December.

The Secretary read the Council's annual report.

The Treasurer (T. Wardale) submitted his statement of accounts for the past session, and the curator (H. Brebner) gave a general account of the properties of the Society under his charge.

These reports being formally accepted, the election of the following gentlemen as office bearers for session 1887-8 took place:—

President—Mr. Forgan.

Vice-Presidents—Dr. T. W. Drinkwater, F.C.S., and W. F. Bashford.

Council (to fill vacancies)—Alexander Ayton, H. W. Bibbs, F. P. Moffatt, James McGlashan, and J. M. Turnbull.

Auditors—A. M. Forbes and Charles Fraser.

W. Forgan read a paper on "Pinhole Photography," which gave rise to an animated discussion on perspective as represented by the pinhole, the lens, and the eye. The subject was adjourned.

Talk in the Studio.

The Society of Arts.—The first meeting of the one hundred and thirty-fourth session of the Society of Arts will be held on Wednesday, the 16th November, when the opening address will be delivered by Sir Douglas Galton, K.C.B., D.C.L., LL.D., F.R.S., Chairman of the Council. Previous to Christmas there will be four ordinary meetings, in addition to the opening meeting. For these meetings the following arrangements have been made:—November 23rd, Professor Silvanus P. Thompson, "The Mercurial Air-Pump;" November 30th, J. B. Hannay, "Economical Illumination from Waste Oils;" December 7th, P. L. Simmonds, "The Chemistry, Commerce, and Uses of Eggs of various kinds;" December 14th, Sir Philip

Magnus, "Commercial Education." During the session there will be six courses of Cantor lectures—"The Elements of Architectural Design, by H. H. Statham; "Yeast, its Morphology and Culture," by A. Gordon Salamon; "The Modern Microscope" (being a continuation of the recent course of Cantor lectures on the "Microscope"), by John Mayall, jun.; "Alloys," by Prof. W. Chandler Roberts-Austen, F.R.S.; "Milk Supply and Butter and Cheese Making," by Richard Bannister; "The Decoration and Illustration of Books," by Walter Crane. Two juvenile lectures on "The Application of Electricity to Lighting and Working," by William Henry Preece, F.R.S., will be given during the Christmas holidays. Further particulars as to the work of the Society will be found on page 713.

PIFFARD'S NEW MAGNESIUM LIGHT.—With respect to this, *Anthony's Bulletin* says:—"The neatest and decidedly the best adaptation of magnesium to photographic work at night was lately exhibited before the Society of Amateur Photographers of New York, by Dr. H. G. Piffard, a gentleman well known in scientific circles for his applications of science to useful ends. Dr. Piffard first used common gunpowder, mixed with the magnesium powder, and fired in the open air; but being a sportsman and fond of fire-arms, he afterwards concluded that it would be much more practicable to use the mixture in a gun or pistol-barrel. This gunpowder mixture proved a great success. It was readily obtained, easily mixed and used, and the ingredients were articles of commerce in all large cities. But the doctor did not stop at his first success, and he very soon went a step further, and used another explosive to fire his magnesium powder, this time something peculiarly fitted by association and use for photographic purposes—we mean gun-cotton. By using this explosive, dusted over with the magnesium powder, the most perfect results are obtainable. The explosion is instantaneous; there are no poisonous fumes; and the negatives obtained are not distinguishable from those taken by daylight. There are no hard shadows, because the source of light is not a point, but a flood of illumination which is diffused over the whole subject. The proportion of gun-cotton to magnesium powder is about one of the former to two of the latter. The negatives taken the other evening were obtained by using fifteen grains of magnesium and seven grains of gun-cotton." A correspondent sends us a print of a negative which is the result of his first attempt with ten grains of magnesium powder on six grains of gun-cotton, burnt at a height of 1 foot 9 inches, and 9 feet from the sitter. The result is such as to lead us to believe that with double the light a good and well-exposed negative might have been obtained

NEW PHOTOGRAPHIC CHARTS OF THE HEAVENS.—The preparations for work as arranged by the congress of April last are progressing satisfactorily, and it is expected that ten of the telescopes will be ready by the end of 1888, so that work can be actively commenced in 1889. Admiral Mouchez speaks hopefully of the enterprise.

PHOTOGRAPHY IN NATURAL COLOUR.—A correspondent of the *English Mechanic* quotes the following from Smiles' Life of Samuel Lancaster:—"Having read an account of the experiments of M. E. Becquerel, a French savant, on photographing in the colours of nature, my curiosity was awakened. I carefully repeated his experiments, and convinced myself that he was correct. I continued my experiments in heliochromy for a period of about two years, during which time I made many photographs in colours, and discovered a method of developing the coloured image which enabled me to shorten the exposure to one-fortieth of the previously required time. During these experiments I came upon some curious results which, I think, might puzzle our scientific men to account for. For instance, I proved the existence of black light, or rays of such a nature as to turn the rose-coloured surface of the sensitive plate black—that is, rays reflected from the black paint of drapery produced black in the picture, and not the effect of darkness. I was, like Becquerel, unable to fix the coloured image without destroying the colours; though the plates would keep a long while in the dark, and could be examined in a subdued, though not in a strong light. The coloured image was faint, but the colours came out with great truth and delicacy."

PHOTOGRAPHIC CLUB. — The subject for discussion on November 16th will be on "Rolling and Burnishing Photographs."

To Correspondents.

*** We cannot undertake to return rejected communications.

*** Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

UNITED KINGDOM DRY-PLATE COMPANY.—Thank you for the sample of your plates, but we do not make a practice of testing or reporting upon dry-plates.

RATTLER.—We do not know of any; but in the case of the finished prints you can give matt surface by squeezing down on ground-glass which has been very slightly waxed. When dry, strip the prints off.

H. WILLETT.—We are not quite sure whether it is due to imperfect fixation, or to some deleterious substance in the mounts.

T. N.—You should not trust to a verbal message in such a case.

JUS.—1. Its mere admission to the Exhibition is an honour which should much gratify the producer, and where merits alone determine the awards, such a result as you seem to think probable is hardly to be expected. 2. No, write to the person concerned. 3. Such a notice is absurd; look into the matte again.

A. TREYER EVANS.—1. Thank you: we shall have great pleasure in making use of it. 2. We do not know of any means of working without a protective film.

VERAX.—1. We are not aware that sheet gelatine has been successfully made in bands unless supported by paper or some similar material. 2. By successive coatings on the same band of paper. 3. Smooth paper.

J. C. J.—To hand. Many thanks.

W. K. BURTON.—It is very curious, and we will write by same mail as that taking this number.

C. H. L.—April 15, 1887, and May 6, 1887; this latter containing the sketch.

R. DALRYMPLE SMITH.—It is very good of you to take so much trouble in the matter. We will see to it.

R. BROADHEAD.—See the YEAR-BOOK for 1887.

VARNEY.—1. Try the magnesium and gun-cotton light referred to on p. 697 and on p. 703 of last week's NEWS; also in the first column of this page. 2. A portrait lens or a Voigtlander's portrait-euryscope. 3. None whatever when the magnesium light is used, but in the case of a yellowish light there would probably be some gain.

M. CAPPELLI.—They are probably due to some chemically active dust settling on the plates, and it may be the dust comes from some workshop or factory in your neighbourhood. If all openings through which air enters are covered with muslin moistened with glycerine, it is probable your troubles will be removed. Please let us know the result.

T. M. B.—1. We cannot give an opinion as to the validity of the patent, but you are quite safe in working commercially the process published in the PHOTOGRAPHIC NEWS of the date referred to. 2. Here again is a matter concerning which we cannot take the responsibility of advising, as, in the case of our opinion being erroneous, you might be subjected to considerable loss. 3. Look through the back volumes of the PHOTOGRAPHIC NEWS and of the *British Journal of Photography*; also run through the photographic annuals. 4. Go to a meeting of the Photographic Club at Anderton's Hotel, Fleet Street, one Wednesday evening at eight o'clock; introduce yourself to the chairman, and tell him you would like to talk with some of those interested in the matter.

CHAS. PAUL.—Next week, if practicable.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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PHOTOGRAPHIC HYGIENE.

Few will deny that immense good has been done towards improving the public health by the vigorous impulse which has been and continues to be given towards a proper recognition of the laws which regulate health and disease. Every calling has its own special features from a sanitary point of view; indeed, it is the business of everyone to examine how far the peculiar dangers of his occupation may be avoided, and what particular precautions he should adopt to preserve that soundness of health which is the backbone of energy and business, as well as the foundation of happiness and prosperity.

Photography may perhaps be said to rank amongst the healthiest occupations that exist. Without the weariness of undue monotony, or the wearing influence of excessive excitement, there is in the practice of photography that mingling of mental and manual exercise which points it out as a healthy recreation for the amateur, and a pleasant occupation for the professional man.

There are, however, certain points which should be carefully attended to, if the laws of health are not to be set aside, and these we will now briefly consider.

Perhaps one of the most important sanitary improvements that could be made would be the more effective ventilation of the dark room. The difficulty of admitting air without light has resulted in many cases in the perfect exclusion of fresh air from the room in which many a photographic assistant has to pass a large portion of the day. Let us, for instance, take the case of a person employed chiefly in developing negatives. We may, perhaps, take five minutes as the average time taken for a single negative, although probably twelve negatives per hour would be more than a careful person would manage. On a busy day, therefore, a considerable amount of time would be spent almost hermetically sealed in a room, generally of small dimensions, and filled with an atmosphere too often vitiated by fumes of ammonia, or perhaps even by prussic acid, or by the smoke and smell of a badly ventilated stove or lamp. If the wet process is much practised, we have to add to these evils the constant exposure to fumes of ether and alcohol, and an additional imprisonment during the preparation of the sensitive plate. Now it is a well-known physiological fact, and one which has been experimentally proved, that if a man be shut up in a close room, having the form of a cube seven feet in the side, every particle of air in that room will have passed through his lungs in twenty-four hours, and a fourth of the oxygen it contained will be replaced by carbonic acid. This latter gas, together with carbon monoxide from incomplete combustion in the lamp or stove, will be sufficient to produce headache and lassitude in a very short time if there is not good ventilation. We have known some dark-rooms, to stay in which even five minutes on a warm day would be enough to make the strongest pant for fresh air. And we have seen, in practice, cases of development being prematurely concluded, and negatives spoiled, because the manipulator, unaccustomed to such a deprivation of fresh air, has nervously felt compelled to open the door of the dark room. It is not necessary here to describe any special form of ventilators, as this has already been done in former issues; but we wish to urge upon all who have a badly-ventilated room the absolute necessity of attending to this point if they would avoid permanent injury to their constitutions, by a prolonged continuance of the evil.

Again, some persons are peculiarly susceptible to the effects of ammonia fumes during alkaline development. The chief symptoms appear to be somewhat similar to ordinary influenza, probably arising from the irritating action of the strongly alkaline fumes upon the mucous membrane of the nose and throat. Even those who do not appear to be influenced by ammonia fumes would do well not to bend too closely over the developing dish, as the daily repetition of the pungent action of ammonia will doubtless be found to produce evils of somewhat the same nature as those acquired through the constant use of snuff or the smelling bottle. It is fortunate that substitutes for ammonia exist in the form of potash and soda, and the day may not be far distant when even the most strenuous supporters of old developing formulæ may be induced to give up ammonia altogether.

The ventilation of the reception and operating rooms is of no less importance than that of the developing room. It must be remembered that glass, while highly diathermanous to the direct rays of the sun, is less transparent to the heat rays of lower intensity radiated from terrestrial objects. Thus every operating room is more or less of the nature of a green-house, and the atmosphere in summer may become almost intolerable. Now sitters of a nervous temperament are often peculiarly susceptible to the influence of an overheated atmosphere. The face will often assume a worn and haggard look after a stay of only a few minutes' duration in a close unventilated room. If, therefore, photographers wish to be successful in securing pleasant expressions and satisfactory portraits, it is of the utmost importance that the air of the operating room should be kept fresh and cool in summer, and comfortably warm in winter. In some operating rooms the atmosphere is most oppressive, and the discomforts are sometimes largely increased by the powerful odour of ether, proceeding from the adjacent dark room. Sitters of delicate idiosyncracy are influenced by the slightest circumstances, and their comfort must be minutely studied if their patronage is to be secured.

Turning now from the subject of ventilation, there is still another point to be considered in connection with the health of the dark room. We refer to the supposed injurious effect of the ruby light upon the eyes, and the equally bad influence of frequent and sudden transitions from the darkness of the developing room to the strong glare of daylight. In this case the mischief, if any, would be none the less serious because its effects are but gradual. Probably the majority of chronic diseases, if they could be traced to their origin, would be found to arise in some long-continued cause, working slowly but steadily towards its unexpected result. The sudden transitions from darkness to light would be more likely to produce injury than the influence of the ruby light, since it causes a strain upon the ciliary muscles, which regulate the size of the iris. These muscles naturally act but slowly, and sudden transitions are consequently injurious if continually repeated. The obvious remedy is to admit light, but gradually, after developing. It will be found a good plan to keep a gas jet turned low in the room, and to turn it up before going into daylight, as the transition from ruby to gaslight, and thence to daylight, will not then be found so painful.

In connection with eye-strain we must not omit to consider the case of persons engaged continuously in retouching. Although there is danger of the eyes being injured by want of proper illumination, the great danger to which retouchers are liable is the result of the strain produced by using the eye comparatively close to the work. The natural focus of the eye is for distant objects, and when any near object is viewed the eye is specially focussed for this distance by muscles designed for that purpose, and the nearer the object the greater is the amount of muscular exertion in the eye. It is the natural tendency of the eye to become more long-sighted as age increases, and hence the difficulty of seeing near objects closely will naturally increase from this cause alone. The moment, therefore, that any difficulty is experienced in seeing close work, the eye should be assisted by suitable glasses, as over-strain in the effort to see is not only painful in itself, but is also liable to aggravate the mischief.

Amongst the special branches of photography which appear to have a somewhat serious influence upon health, none is perhaps more conspicuous than carbon printing. In this case it is almost impossible to avoid immersing the hands in water containing potassium bichromate in solution. Whether it is in sensitizing the tissue, or in mounting prior to development, the skin is continually in contact with a solution which appears to have in course of time a most serious influence upon persons of a certain constitution. Again, in developing, the hot water very soon becomes a weak solution of bichromate, and, the pores of the skin being more open, there is the greatest risk of injurious results. Various symptoms of bichromate poisoning have been described, amongst which are itching and burning of the fingers and the gradual formation of minute pustules, especially upon the wrists and back of the hands. Gradually the pustules die away, the skin cracks, and painful sores are produced. If the skin happen to be at all abraded, the action of the bichromate is to produce most painful ulcers. Obviously, therefore, workers in carbon should endeavour as far as possible to keep the skin free from contact with bichromate solution.

The danger of allowing an abraded skin to come into contact with either potassic cyanide or pyrogallol need not be dwelt upon. In all cases the photographer should pay that careful and constant attention to the laws of nature by which alone sound health can be maintained.

* * *

INSTANTANEOUS PHOTOGRAPHY FOR RECORDING POLITICAL EVENTS.

Some remarks in the *Times* have called forth a few strange comments, and among the strangest the following from the *Daily Telegraph* of the 11th inst.:—

> Naturally, we should like to know whether the time be near or far distant when photography in the real colours of nature will become an accomplished fact, or whether the art of focussing will ever be brought to such a degree of perfection as to prevent a gentleman's hat, when held in the hand of the wearer in the foreground of a portrait, from looking about three times the size of his head. Pending the solution of these problems, it may be quite as interesting to inquire into the further purposes of utility to which photography, even as we possess it in its existent infantile form, may be adapted. There can be little doubt, in the first instance, that the camera and the sensitive plate have been eminently serviceable to the cause of criminal justice. Mr. Luke Fildes' admirably graphic picture of "The Bashful Sitter," in which a brawny prisoner is being held down by main force by a number of warders and police-constables, while a photographer does his best to bring the lens to bear on the felonious features of the unwilling contributor to a Scoundrel's Portrait Gallery, marks the earlier stages of a system which is at present carried out with great minuteness and efficiency in every gaol in the kingdom, and which furnishes Scotland Yard with a whole Pinacothek of rascals, whose effigies can be internationally exchanged until every police headquarters in the civilised world is provided with their interesting effigies. Photography, too, has been the silent but helpful handmaid to microscopic science, to selenography and heliography, to pathology, and to meteology; while instantaneous photography of a simultaneous and multiple nature for a short period threatened to revolutionise the art of sculpture, and really enabled an ingenious Californian operator to demonstrate the curious difference which exists between the genuine and the conventionally portrayed gallop of the horse. This same instantaneous photography, if Mr. W. H. Mallock is to have his way, may be turned to far different and more momentous ends. The ingenious author of "The New Republic" proposes, in all apparent gravity, in a letter to a contemporary, that instantaneous photography should be pressed into the service of obtaining evidence at Irish meetings and evictions. Considering, as Mr. Mallock puts it, the conflict of testimony as to many events in the Sister Isle, especially as regards the respective conduct of the people and the officers of the law, it would, in his opinion, be highly desirable if, on such occasions as evictions and political meetings, the Government reporter were accompanied by a Government photographer. As for Mr. Mallock's subsequent proposal that political prisoners might be advantageously photographed "at moments when they were totally unconscious of the operation," in order to ascertain whether they looked like martyrs or not, to discuss the feasibility of the propriety of adopting such a course would be needlessly entering into the domain of controversy; but one of Mr. Mallock's suggestions in this direction may be, from a purely technical point of view, mildly traversed. He seems to be under the impression that the pictures thus obtained would be interesting to the student of human nature as well as to the student of politics. Let him consult a practical photographer, and he will at once learn that the very finest of instantaneous photographs will only give the general aspect of the scene delineated by the action of the solar rays, and that such a photograph is usually, in parts, so blurred and confused as to require a large amount of "touching up" before it is fit for public inspection. Now, it strikes us that, if an instantaneous photograph is to be accepted as evidence of a particular transaction, "touched up" evidence would be as untrustworthy as "cooked" financial accounts. The indispensable condition to the graphic success of an instantaneous photograph is the entire immobility of the object focussed. Thus, in the case of a photographic transcript of Ludgate Circus at high noon, the houses and shops would be the features most distinctly reproduced, for the simple reason that solid edifices are not accustomed, save in the event of an earthquake, to move. A runaway horse, or a pickpocket excited to celerity of pedestrianism by the cry of "Stop thief!" would appear in the positive as a smudge or a hazy phantom of indefinite length, and nothing more. Even clever Mr. Muybridge, of San Francisco, although by the instantaneous process he incontestably proved the fact that the hardest gallop which the fastest racehorse can achieve is only a series of jumps, and at no period of the run the animal's four legs are off the ground horizontally extended, could not succeed in making his instantaneously-reproduced racers look like horses. They resembled monsters and chimeras dire. Their hind legs were involved in knots of Gordian intricacy with their fore legs; and when a trotting waggon and its driver were depicted, as well as the fast-trotting horse itself, the wheels

impinged on the animal's quarters, and the gentleman on the box assumed the similitude of a jockey bestriding instead of driving the horse. How much more complicated and confused would be the "instantaneous" presentment of an Irish row? Does good Mr. Mallock imagine that the instantaneous process would give anything like a faithful rendering of stones whizzing through the air, forests of blackthorns descending on official heads, or policemen's helmets being kicked about by the populace? Does he think that instantaneous photography, at the moment when a volley of buckshot was being fired from the upper window of a police barrack, would afford the slightest tittle of evidence as to the identity of the constables who were firing? As for the speakers from the platforms or the waggonettes, the most elementary acquaintance with the characteristics of Hibernian oratory would at once make manifest the absurdity of the notion that any camera, portable or otherwise, would be capable of transmitting to ocular view the gestures or the expression of a patriot "on the stump" and "in full blast." The thing could not be done. Nothing could rise above the level of the vague and the undecided without the "touching up"; and touching up, so far as evidence is concerned, is a clearly inadmissible process. At the same time we hasten to admit that, photography being still in its infancy, a time may come when the as yet premature and inchoate suggestions of Mr. W. H. Mallock may bear good fruit.

In the *Daily Telegraph* of the following day we find a paragraph which seems to indicate that some person has been amusing himself by fooling the *Telegraph*, there being no manager of the Photographic Society of Great Britain; the paragraph in question being as follows:—

The manager of the Photographic Society of Great Britain writes: "In reference to some remarks in to-day's issue of *The Daily Telegraph* about instantaneous photography, may I be permitted to state that in the present annual exhibition of this society we have on view many various examples of instantaneous photography which are not only not blurred, but are remarkably sharp and clear; yachts racing, where every rope line is quite sharp and distinct; Windsor on its Jubilee day, where many hundred faces are recognisable; street views in London, where the rapid record of figures in motion is very interesting; and horses actually leaping over fences and hedges—these look as if suspended in air. Therefore it would be comparatively easy by daylight to secure photographs of large bodies of people collected together, where 'motion,' either 'pacific' or 'violent,' would be distinctly recorded."

With respect to the same question, the *Pall Mall Gazette* of Tuesday last has the following:—

Last week, Mr. Mallock suggested, in the congenial pages of the *Times*, that the Government should employ an instantaneous photographer at Irish disturbances. The proposal won Mr. Mallock golden opinions in the Unionist press, and in the salons of the great, where he had already been voted unendurable, he has been accorded a fresh lease of toleration. On Friday, at Shark, one of the Achill Islands, in the course of a desperate affray, the Irish police shot an old woman, who was attempting to protect her poultry from a seizure for cess. The old woman did not die at once. There was just time for the priest to come up, and, kneeling over her as she lay on the roadside, give her the last sacraments of the Catholic Church, the people standing round. Then she died. It was a feature in Mr. Mallock's suggestion that the dry plates should be large enough to show the expression on the faces of the people. We hope that the Government had already adopted the plan before last Friday, and that a Government photographer was with the Achill expedition. His pictures, if sold cheap at the post offices, like some other Government publications, would be useful during the next batch of elections.

A COPYRIGHT CASE.

On Friday last, in the Chancery Division of the High Court of Justice, before Justice Stirling, the case of "Wooderson *v.* Tuck and Sons" came on for hearing. The following particulars are from the *Standard*:—

The plaintiff lives at Leyton, Essex. The defendants were art publishers, in Coleman Street, trading as Raphael Tuck and Sons. This was a motion for an injunction to restrain the defendants from copying, reproducing, and selling copies of a photograph which the plaintiff had registered. In July, 1885, the plaintiff's two children were photographed by Mr. William Schmidt, in the employ of Mr. George Goodman, photographer, Margate. After the execution of six cartes-de-visite, it was alleged that in addition to the prices agreed upon to be paid for them, 7s. 6d., the plaintiff consented to six cabinets being taken at the reduced price of 10s. 6d., instead of 17s. 6d., in consideration of an extra one being taken by Mr. Schmidt for his own business purposes. In August, 1886, Mr. Tuck purchased from Mr. Goodman a copy of the cabinet, and thereupon proceeded to make copies, which were now being sold as New Year and Christmas cards. On the 22nd October, the plaintiff discovered this fact, and accordingly he registered the copyright on the 26th October. A correspondence between the parties took place, which resulted in the issuing of the present writ. The defence was that the plaintiff had not complied with the provisions of the Act; and, further, that there was a contract by which the negative, in consideration of the reduced price of the cabinets, became the property of Mr. Goodman, who had, consequently, the right to sell it to Mr. Tuck. The Judge held that the plaintiff had not complied with the provisions of the Registration Act. According to the authority laid down in the case of "Nottage and Jackson," the copyright in the negative was the property of the artist who arranged the instrument, and posed the objects to be photographed, unless a special agreement was made to the contrary. He must refuse the injunction asked for.

HUNTING AFTER PORTRAITS.

THE EXPERIENCES OF A JOURNALIST.*

Our next commission was of a far more difficult nature—difficult not only in regard to the portraits, but also in respect to the letter-press which was to accompany them. Editors of newspapers always affect to look upon an action for libel as the best thing that could happen to them; at the same time they discreetly avoid the law if possible. In this case all the subjects for illustration were what is known as shady individuals; the descriptive matter was to be caustic and "slating" as to the dealings of these gentry as a class, but had to be written so as not to connect the remarks with any particular man whose portrait was given. How this was accomplished scarcely comes under the scope of the present article, and it is only necessary to say it was managed after a fashion.

Easel's task was, if anything, more embarrassing. The only places where he could see his "subjects" were outside a certain building in the City, at their favourite refreshment bar, or at the restaurant where they dined. Neither the refreshment bar nor the restaurant was to be depended upon. Besides, there were drawbacks of a serious nature. To hang about a drinking bar for a couple of hours on the chance of some of the men strolling in entailed risks which one does not care to incur deliberately. As for stopping in a City restaurant a minute more than is absolutely necessary for the speedy bolting of your food, it is not to be thought of. All these dining places are looked upon simply as necessities—never as luxuries. We had consequently to fall back upon the pavements where the men we wanted congregated.

In this case our guide was one who personally knew all the men necessary to be sketched, and we had, therefore, simply to follow his directions. But as he stopped to speak to somebody every half minute, and as he could only whisper his information in fragments, which information I had to convey to Easel in another whisper, the result was somewhat chaotic. At the end of half an hour Easel looked at me in despair, and muttered, "For goodness sake, let us go somewhere and compare notes; I'm getting most awfully fogged up as to who's who."

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* Continued from page 658.

We retire from the scene to a neighbouring haven of rest, and a dialogue ensues something in this style : "Have you got the man with the white waistcoat and serge jacket?" I inquire. "No; is he important?"—"Certainly. He was leaning against the lamp-post. Have another look at him when you go out. The lamp-post is his favourite resting place?"—"What about the little man with the straw-coloured hair and moustache?"—"Hair closely cropped behind? Rather large hat?—Yes; he's all right."—"And the fellow who I thought had a Young Man's Christian Association face?"—Yes. Had his hands in his pockets and his eyes fixed upon the pavement?"—"Then I've got the dark, sallow-faced man who was smoking a cigarette."—That's all right."—"By the way, he has a habit of twirling his moustache. You might get him in that pose."

We compare notes as to two or three more men, and stroll out again, when Easel has another look and fixes certain doubtful points in his memory. While so engaged, up comes our guide. "Oh, I say," says he, "you must have a sketch of ——."—"Certainly. Which is he?"—"Oh, he's not here. We shall have to go to his office."

I look blankly at Easel, and Easel returns the glance. How can we go to a man and say to him, "We want your portrait," and then insert it in an article decidedly uncomplimentary to the class of the community to which he belongs? We mention this little difficulty to our guide.

"Oh," says he airily, "that can be easily got over. I met him a few minutes ago and told him I had a friend who had a friend in the country who might possibly buy something he has to sell. He's delighted at the idea, and told me to bring you along at once."

I feel a kind of shiver at the prospect. Easel does not seem much concerned, but then he will have no talking to do. He will merely sit quiet and see that all is fair, as it were. However, there is a spice of novelty about the undertaking, and away we go. We are solemnly introduced, and the victim forthwith launches into praises of the article he wishes to dispose of. In the interest of my friend in the country I am naturally cautious, and make several inquiries which have the desired effect of prolonging the interview, and so enable Easel to study the characteristics of the unconscious sitter. When there is no more to be said we leave, with the vague understanding that I will write to my "friend in the country" and give him all the particulars. Whether securing a portrait by means of a subterfuge is wholly justifiable, I am not going to say; but I sincerely hope the gentleman who had such prospects held out to him was not seriously disappointed. I do not think he was, as I heard afterwards he had a hearty laugh at his portrait, He was not aware, by the way, it had appeared until some "good-natured friend" sent him a copy of the paper. As may be expected, his picture was the most successful of the batch. The least happy, in the opinion of the critics, was that which, as a likeness, was most correct. This was the portrait of the man with the straw-coloured hair. It so happened that he was a little man, but Easel, by an accident, sketched him larger than any of the rest, thus conveying a false idea of his stature sufficient to prevent him being easily recognised. The experience was instructive, and I have arrived at the opinion, formed after comparing the criticisms on a large number of portraits, that a person is recognised not so much by correctness of drawing as regard to features, as by the rendering of some subtle characteristic, which characteristic may not necessarily be confined to the face. It is a common thing for a person to forget the features, but the memory will be recalled by the association of ideas when the sound of the voice is heard. In the same way a trick of carrying the head, an action of the hands, a twist of the shoulders, are more expressive of personality than is correctness of measurement in the nose, mouth, or eyes.

We also became aware of another source of trouble. Photography sometimes comes to grief in the rendering of certain shades of hair—red, for instance. In the same way a totally incorrect idea may be conveyed by the artist, especially if his sketch happens not to be printed well. One of the series just described had tolerably fair hair and moustache. The lines chanced to be drawn rather close together; the ink, not being of superlative quality, clogged, and the result was a man with black hair. Hence, his friends thought the likeness was not good. In another instance, where a middle-aged man had a fair beard, which was rendered about right in tone, the complaint was, he looked too old. "You've made my beard almost white," he said. It is, however, as well to mention that in this case it was only the man himself who found fault, and, as every photographer knows, the sitter is about the worst judge possible of his or her portrait.

A third instance of dissatisfaction may be noted in the case of the proprietor of a well-known restaurant of the quaint, old-fashioned type. "Well," he remarked, good-humouredly, "I am bound to say, you *have* made me an old cuckoo. You've taken much more pains over the *chef*." The fact was, too much prominence was given to the picture of the *chef* and his grill, and not sufficient to the proprietor. This, undoubtedly, was an error in judgment, and those who indulge in sketches of this nature had better note that it is always a wrong tack to go upon when the inferior is made to look more important than the superior.

(*To be continued.*)

CAPTAIN PIZZIGHELLI'S NEW PLATINOTYPE PROCESS.

BY HERMANN C. GUNTHER.

Now, as the platinotype process is so rapidly gaining in favour and exciting so much interest in England—the birthplace of the process—it gives me pleasure to call the attention of the readers of the Photographic News to the marked improvement which has been recently made in the manipulation of this process.

Probably all photographers are sufficiently familiar with this process to know that in printing the platinotype paper the image which appears is not brown, or purple, but of a faint greyish-yellow colour, and therefore it is rather difficult to judge whether a print has had sufficient exposure in the frame, as may be done in the case of albumenized paper.

To remove this drawback, which to some degree has been prejudicial to the popularity of this printing process, Capt. Pizzighelli—to whom we are indebted for much valuable information on the subject of platinum printing—has made many experiments, but only recently he has succeeded in finding out a method of producing platinotypes directly in the printing frame without development.

The principles of this method are the following :—

1. If to the sensitizing solution, certain vehicular substances are added, this solution will be prevented from penetrating into the body of the paper.

2. If to the sensitizing solution one of those substances which serve as developers is added in the very beginning, a reduction of the platinum salt takes place directly in the printing frame by atmospheric influences.

The advantages of the new process are, therefore, very important, as there is no longer a necessity for a preliminary preparation of the paper, and as you can judge of the exposure as accurately as with silver. Besides this, the development of the paper is entirely omitted. A simple, short washing of the prints, first in acidulated, then in ordinary water, is sufficient for finishing the pictures.

Sensitizing the Paper.—For coating, Rives or Saxe paper may be used, either glossy or with a matt surface.

Solutions of gum-arabic and of arrowroot have been found the best vehicular substances for the sensitizing liquid, but the former has proved to give better results than the latter. They are mixed in the following manner:—

I.—Gum-arabic	... ...	50 grammes
Distillated water	... ...	100 c.c.
II.—Arrowroot	... ...	2 grammes
Distilled water...	... ...	100 c.c.

The latter is boiled in the usual manner to paste. Before use mix—

Sensitizing liquid	2 parts
Gum solution I.	1 part
Or,	
Sensitizing liquid	1 „
Arrowroot paste II.	1 „

The mixture is well stirred until it forms an entirely homogeneous liquid, and then it is filtered through muslin.

The coating and drying of the paper, and its storing in tin cylinder boxes, in which dry calcium chloride is placed, is the same as in the case of the old platinotype process.

The Sensitizing Solution is prepared as follows:—To the normal ferric-oxalate solution* is added in the dark room, and keeping the dish rocking, as much of neutral ammonium or sodium oxalate as will just dissolve at the ordinary temperature. For this purpose will be required of the above-named salts:—

To normal ferric-oxalate solution...	100 c.c.
Neutral ammonium oxalate ...	18 to 20 grains
Or to normal ferric-oxalate solution	100 c.c.
Neutral sodium oxalate	15 to 18 grains

By formation of the corresponding double salt the brownish grey colour of the ferric oxalate changes to a beautiful emerald green. If the solution begins slightly to darken, this will indicate that the saturation is completed. As soon as this takes place, no more ammonium or sodium oxalate should be added; keep the dish rocking for some further time, allow to set, and then filter.

The solution may be mixed as follows:—

Chloro-platinite of potassium solution (1 part to 6 parts of water)	24 c.c.
Ammonia-ferric oxalate solution, or sodium ferric oxalate solution...	22 „
Gum solution I.	23 „

If ammonium oxalate be added, the prints will be of a more bluish tone; whilst, by the addition of sodium oxalate, they are rendered more brownish. The former gives somewhat softer prints than the latter. As to the sensitiveness, there has been found no marked difference between the two salts.

No definite statements can as yet be made regarding the keeping qualities of the new paper, as since the perfection of the new process only a few weeks have elapsed; but the samples kept within this period remained unchanged.

Chlorate of potash may be added with the effect of increasing contrast, and this may be done in the same manner as with the old platinotype process.

The above-given quantity of the sensitizing liquid is sufficient for five sheets of the ordinary size. The exposure of the paper no longer offers any difficulty. As the results will be more satisfactory if the paper possesses a certain degree of surface-moisture (as in the case of silver printing) it will be well to take the sheets to be worked a few hours before use off the tin cylinder, and to hang them up in the dark room. In placing the paper on the negative, it is, with this process of course, not necessary to place behind it a sheet of vulcanised india-rubber sheeting or a piece of waxed paper.

In printing and finishing the picture the following modifications are allowable:—

1. The printing is carried on until the image has appeared in all its parts. The picture when taken out of the frame should not be darker than what it should be when finished.

2. The printing is only continued until the picture is in general visible; but the delicate half-tones are still wanting. The picture is taken out of the frame and kept separately. In about half an hour to two hours' time the picture will be finished by itself, as the reduction of the platinous chloride, once introduced, is continuous in the dark. Or, the picture is developed out with a cold, diluted solution of sodium carbonate.

A good solvent is the following:—

Saturated solution of soda carbonate ...	5 c.c.
Distilled water	100 c.c.

Into this solution is immersed the picture, and allowed to remain until all the delicate details are to be seen, which will require only a few seconds.

3. Printing is continued about as far as with the ordinary platinotype paper, *i.e.*, until only those parts of the negative which are clear glass, or nearly so, are distinctly visible, then development is carried on as with the ordinary platinotype paper.

The pictures printed according to one of the methods 1, 2, or 3, are placed into

Hydrochloric acid	1 c.c.
Water	80 c.c.

and allowed to remain there until the yellow colour of the ground of the paper has disappeared. Then they are, for ten to fifteen minutes, washed in two or three changes of water.

By publication of his experiments Captain Pizzighelli has undoubtedly rendered a great service to the many friends of the platinotype process, which stands now as one of the simplest and most attractive photographic printing processes.

I hope that what I have given here has been sufficient to enable those who may feel so disposed, to make a few successful experiments with this beautiful and so much improved process.

Review.

Photographischer Almanach und Kalender fur das Jahr 1888. Price one Mark. (*Dusseldorf, Ed. Liesegang's, Verlag.*)

This useful annual comes to hand in good time, and although not so bulky as the English photographic annuals, is crowded with useful information in a concise form. The illustrations and whole get-up are excellent.

PRINTING AND ENLARGING ON BROMIDE PAPER.

BY THOMAS SCOTTON.*

The prints I purpose developing before you to-night have been enlarged by daylight. I usually get a four-legged table, and place it near a window having a north-east aspect, and upon it place my camera with the ground glass next the window, then darken the room by blocking out the light from all the windows except the one next to which I am about to work; upon this latter window I put a piece of canary medium, and hang loosely over this a sheet of brown paper. This being done, I fix a mirror outside the window at which I have placed the camera, at such an angle that the rays of light from the sky are reflected through the negative about to be enlarged. The negative is then placed in the dark slide of the camera, and put in its position, both shutters being drawn, and care must be taken that no light comes into the room except that which comes through the lens. If an enlargement is to be made from a whole-plate negative, or a larger size, the focussing screen can be removed, and the negative put in its stead. An easel with a drawing board attached is then placed at such a distance from the camera according to the size of the enlargement required. A piece of white paper or card is then fixed on the drawing board, and the image sharply focussed thereon. When sufficient sharpness has been obtained, the paper or card on the easel is marked with pencil as a guide where to fix the bromide paper which is to receive the enlargement. The lens is then capped, and the piece of brown paper which is hanging loosely over the canary medium on the window is slightly raised to give sufficient light, thereby enabling the operator to fix the bromide paper in its proper position ready for the exposure to be made.

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* As to the preparation of the normal ferric-oxalate solution and the chloro-platinite solution, I must refer the readers to the work by Pizzighelli and Huebl, "Die Platinotypie (Vienna, 1882), p. 50, or to the French edition of this book (Paris, 1883). p. 60.

* A communication to the Derby Photographic Society.

Nothing but experience can determine the exposure, but such experience can be gained by one or two trials made on scraps of bromide paper. I may say, however, the greater the enlargement, the longer the exposure required.

The picture I am now about to develop has been enlarged from a whole-plate negative in the manner already described. The exposure it had was nine minutes. It may seem rather a long time to give, but, being one of the dullest months in the year (November) I find it none too much, as you will see. Now the next picture, although enlarged to the same size as the last, was from a negative 10 by 8. The light being much brighter at the time, the exposure was 1½ minutes; but, of course, much depends upon the negative.

I need not mention to you the proportions of the developer, as full instructions and proper formulæ are sent out with each packet of paper.

With reference to contact printing, I need say but little. Very thin negatives are best printed by a weak yellow light, like that obtained from a paraffin lamp; this will ensure a vigorous print from a negative that would otherwise be too thin and flat. If daylight is used, one second will be found sufficient in diffused light, or even too much. I should therefore recommend artificial light in preference.

Again, as regards the exposure, much depends upon the density of the negative. The negative I shall now print from will require about twelve seconds' exposure, one foot away from an ordinary gas burner. The development, as you will perceive, is exactly the same as for enlargements. I may add the paper used to-night is Eastman's A and C.

THEORETICAL CHEMISTRY IN ITS PRACTICAL BEARINGS ON PHOTOGRAPHY.

BY RALPH W. ROBINSON.

VII.—Printing Processes.

1. *Albumenised Paper.*—Having now investigated the chemistry of the principal negative processes, we will pass on to that of the printing processes, taking first the oldest successful process, and the one which up to the present has held its own against all competitors. There are many processes in which silver plays the principal part, but this is the one which is generally known as "silver printing." It is almost needless to say I refer to the process in which the paper used is coated with albumen impregnated with a metallic chloride, and sensitized by floating on a bath of silver nitrate solution.

The albumenized paper as sent out by the manufacturer is already "salted;" that is, it has already been impregnated with the metallic chloride. What then happens from a chemical point of view when we float this paper on the silver nitrate solution? First this change—

$$AgNO_3 + \bar{M}Cl = \bar{M}NO_3 + AgCl$$

That means we now have metallic nitrate and silver chloride, a double decomposition having taken place. For the production of brilliant prints, however, it is necessary that we should have something besides silver chloride for the light to act upon, for the chloride alone would give a poor, flat picture when fixed, as the fixing bath has considerable action on an image formed exclusively from the chloride, and there are other reasons which will appear below. The other body required in the paper is the compound formed between silver nitrate and albumen, generally called "silver albuminate," but its exact composition and constitution are doubtful. As the chlorine of the metallic chloride has a much stronger tendency than the albumen to unite with the silver, it is necessary to make the silver solution stronger or weaker according to the amount of metallic chloride the albumenized paper contains, for it will readily be understood that to float a strongly salted paper on a weak silver bath would involve the formation of a very small proportion of silver albuminate.

We will now suppose that the paper has been sensitised and exposed to light till it has darkened in colour. Evidently a chemical change has taken place. The action of light has been to reduce the silver compounds. Silver chloride has been reduced to silver sub-chloride, and chlorine has been set free.

$$2AgCl = Ag_2Cl + Cl$$

while the silver albuminate has also been reduced to a less oxidised compound of which the composition is unknown, but which probably bears somewhat the same relation to silver albuminate as silver subchloride to silver chloride. The unaltered silver nitrate which remains in the paper after floating here plays an important part. Were it not for its presence the free chlorine set at liberty would attack the image as it is formed, and so cause a weak and feeble result; but as it is set free it is immediately seized upon by the silver nitrate with formation of silver chloride and nitric acid, the moisture always present in the paper being sufficient to supply the small quantity of water necessary for the reaction; and probably also hypochlorous acid is formed, but as the exact nature of the change is uncertain it is impossible to express it by an equation. Thus, as the printing goes on, fresh silver chloride is continually formed, and additional material supplied from which the image is built up. But at the best, as stated above, an image formed entirely by the reduction of silver chloride would be weak and flat, and here the silver albuminate comes into service, for the reduced compound yielded by it gives the rich colour and depth from which albumen prints derive that beauty which is lacking in prints made by any other process, and has thus rendered it the greatest favourite among the printing processes. Besides this chemical effect, the albumen acts as a sizing, and keeps the image on the surface of the paper, a very important matter in giving depth and brilliancy to the picture.

The picture having been printed must next be toned, for were it fixed without this operation an unpleasant red colour must be the result, and it is the combination of this tone with a colder one, generally produced by substituting gold for some of the silver, which produces the colour most generally admired.

Gold tri-chloride ($AuCl_3$) is the salt generally used for toning silver prints, with the addition of some other substance to modify its action. There are very many formulæ for toning baths, but as two are typical of the remainder, we will only inquire into the details of these two, the acetate and the chloride of lime bath. The action of a toning bath is to substitute gold, of a cold bluish colour, for a part of the warm-coloured silver compound. This action would take place if gold tri-chloride alone were allowed to act in the print. The question therefore arises, why add other bodies to the toning bath? The action between silver sub-chloride and gold tri-chloride is this—$3\ Ag_2Cl + AuCl_3 = 6\ AgCl + Au$. This involves one atom of gold being added to the image, while six atoms of silver are abstracted by conversion into silver chloride, and hence a very serious reduction in the strength of the print. It is therefore necessary that some body must be present which will absorb some of the chlorine, which would otherwise convert the image into silver chloride.

In the case of the acetate bath the sodium acetate effects this with formation of sodium tri-chlor-acetate. In the case of the chloride of lime toning bath it is necessary to have some silver nitrate in the print to absorb the chlorine, the chloride of lime here acting as a restrainer to the too rapid deposition of gold by supplying another source of chlorine to the silver nitrate, and so preventing the action of the silver on the gold tri-chloride becoming too energetic. In short, the silver nitrate performs the same function as sodium acetate, but, acting in a more powerful manner, requires its energy to be restrained by the chloride of lime, which, so to speak, pulls in an opposite direction.

The print, now toned, has one further chemical operation to go through—namely, fixing. This is effected by soaking it in sodium thio-sulphate solution. Any silver sub-chloride that may be now left in the print is converted thereby into metallic silver and silver chloride, the latter, with all the remainder of the silver compounds except that forming the image, being dissolved, the chemical theory of which has been explained in connection with the fixation of negatives.

Notes.

Now that the world has been bicycled or tricycled over, or possibly both, by energetic young men mounted on "machines" by enterprising makers who have willingly paid the expenses of these "wheel-men" for the bold advertisement thus given to them (the enterprising maker, we mean), the wonder is that some equally enterprising maker of photographic apparatus has not already started off a circumnavigating photographer duly armed with a camera, with a polyglotic advertising tablet attached, and with a general roving commission to go anywhere and take everything or everybody. There is certainly a wide field before the innovating firm that first despatches such an expedition as this. To take one instance only: all Europe and America, aye, and Australia too, is consumed with a burning curiosity to look on the lineaments of that mysterious Eastern potentate, the new Emperor of China. Fortune and a West-End studio—if not "fame and Westminster Abbey"—probably await the dashing artist who first focusses the "Elder Brother of the Sun," or transfers to a dry plate the features of the ruler of the Celestial Empire! Think, again, what a run there would be on a really reliable "cabinet" of the great Llama of Thibet, on whom no European eyes have ever gazed, and how the cartes of "the Great Panjandum" would sell if a photographic Stanley were ingenious and indefatigable enough to secure this occult and shadowy potentate.

There would be, of course, a difficulty as to the baggage that would have to be taken. Dry plates cannot be procured in Central Asia; photographic chemists do not flourish amongst the descendants of Ghengis Khan. Possibly, then, a combined "wheeling photographic" expedition might be arranged; or, what would be better still for advertising purposes, an æronautic photographic mission, in which latter case the heroes of the occasion might return with negatives of the great sea serpent in a series of panels or even realistic views of the North Pole itself. If due energy were displayed, the expedition might be ready to start by the 1st of April next.

The old question as to whom the copyright of a negative taken in the ordinary way of business is vested has been raised again in the case of Wooderson *v.* Tuck. The facts are simple enough. The plaintiff recently had his two children—a boy and a girl—taken by a Margate photographer, and some time after discovered that a coloured reproduction of the carte was being sold by a firm of artistic publishers in the form of a Christmas card. What were the precise grounds of objection were not stated, nor is it necessary they should be stated. The fact that his children's faces were sold in this manner was enough for the plaintiff, and he accordingly commenced an action against the publishers. Unfortunately, he did not know what the Act meant by the "author" of a photograph; but this is not surprising, because it is not certain whether the framers of the Act themselves knew until helped out by the decision in the now famous action in reference to the Australian cricketers. In the case last week, as in the cricketing case, the copyright was declared not to be vested in the person who ordered the negative, nor in the proprietor of the studio—who, it seems, was not present when the photograph was taken—but in the assistant who took the negative, and hence judgment was given for defendants. The plaintiff seems to have been very badly advised, for a further element of weakness in his case was the fact that the assistant asked permission of the mother to take a picture of the children "for himself," and how any lawyer could have expected a verdict in his client's favour under these circumstances is a mystery. Of course it may be very wrong that anybody's face should be taken and turned into an article of merchandise, but until the law is altered the "wrong" must remain. It may, perhaps, be comforting to parents with plain-featured children to know that they are not likely to be troubled in such a manner.

When a lady and gentleman are photographed together it is looked upon as evidence of a stronger feeling than mere friendship. There is really nothing in the circumstance itself unless the arrangement suggests an affectionate footing. Even this is not conclusive, because the photographer is often responsible for the pose. The orthodox attitude years ago was the gentleman seated, out of consideration for his legs, which were always awkward to manage when upright, and the lady standing, generally having one hand on the gentleman's shoulder. As nobody but engaged or married people were ever represented in this somewhat inane fashion, it has become their especial property; and for two persons who are neither married nor engaged, but are simple acquaintances, to be thus photographed, is to lay themselves open to remark.

The excuse in a recent action at law where such a photograph was produced was ingenious, but considerably weakened by an after admission. The examination took the following form: "Witness.—As to the photograph it was instantaneously done. Mr. Inderwick.—But you happened to be just caught in the attitude. Witness.—Yes." Up to this point it would appear as though the lady and gentleman had met accidentally, had exclaimed, in Wemmickian style, "Hallo, here's a studio, let's go in," and had been instantaneously photographed before they knew anything about it. Unluckily this theory was knocked on the head by the judge, who put a question, to which the witness replied that he knew he was being photographed at the time, the attitude he was in showing that he had his hand on the lady's shoulder. The admission of the witness that he knew he was being photographed upset the supposition that the pose was accidental. But, on the other hand, supposing he had not known he was being photographed, the thing would have been worse. because the natural inference is that the pose was habitual, and not assumed for purposes of making a "picture." Throwing the responsibility upon the photographer does not mend the matter much, and on the whole the question seems surrounded by such difficulties that the only safe course for any male person to pursue is never to be photographed with any lady unless the latter happens to be his wife or his sister.

The *Scientific American* gives an account of the Henry Draper memorial in connection with stellar photography. A special feature is the attempt now being made by Messrs. Alvan Clark to manufacture a lens which may be equally adapted for visual as well as photographic purposes.

An abstract of the history of stellar photography is given in the same article. The first work is stated to have been done at Harvard College Observatory in July, 1850, when T. A. Whiffle, directed by Professor W. C. Bond, exposed a Daguerreotype plate, and a good image of *a Lyrœ* was obtained. No success followed in the case of fainter objects. The experiments were then discontinued, and resumed when collodion plates were introduced. Professor Bond's work was continued by Rutherfurd until Dr. Henry Draper began to use dry plates, reaching on March 11, 1881, a critical point. He obtained the image of a star so faint as to be barely discernible by the eye through the same telescope. This marked the point where the plate compared in sensitiveness with the retina. The later work of A. A. Common and Dr. Huggins, already familiar to our readers, is also alluded to. We need, however, say no more now, as we propose to commence the reproduction of the article next week.

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Patent Intelligence.

Applications for Letters Patent.

15,377. Walter Philip O'Reilly, 399, Edgware Road, London, Middlesex, for "Improvements in photographic apparatus."—November 10, 1887.

Specifications Published.

12,733. Theo Endean, Photographer, and Frederick George Clark, Broker, both of Cleveland, Ohio, for "Improved photographer's chair."—September 20, 1887.

A chair on a platform provided with castors.

13,380. Jacques Brunner, Winterthur, Switzerland, and Charles Klary, 22, Rue de Beaume, Paris, for "Improvements in or relating to the manufacture of plates or clichés with intaglio or cameo surfaces for printing."—Dated October 20th, 1886.

The Patentee says—

This invention has reference to improvements in or relating to the manufacture of plates or clichés having intaglio or cameo surfaces, that is to say, surfaces either hollowed out or in relief, adapted for printing purpofes. According to this invention the plates or clichés are composed of celluloid or other substances having a similar composition, or of hardened caoutchouc, ebonite, or other combinations of vulcanized or non-vulcanized india-rubber, their intaglio and cameo surfaces being obtained by the use of carbon paper or a gelatine surface that has been acted upon by light so as to form hollows and reliefs thereon.

We have given to this invention the name of "Cellulotype." The method or process of producing a plate or cliché is as follows :—We take carbon paper, or a leaf of gelatine, or a layer of gelatine spread upon glass, metal, or any other surface, and sensitize it with a solution of bichromate of potash or bichromate of ammonia, or other substances capable of sensitizing the gelatine. The gelatine may be of varying thickness, according to the nature of the original to be reproduced. When this preparation is dry, we expose it to the light under a negative or a positive, the whole being obtained by known photographic means. The latent image is then developed by the usual methods, and we obtain an image either positive or negative, as the case may be, consisting of hollows and reliefs, the surface being deeper or more elevated, according as the layer of gelatine employed was thicker or the exposure to the light more or less prolonged. The photographic negatives or positives employed may be obtained hatched or grained if images in half tones are required, or ordinary negatives or positives may be obtained by the means usually adopted if a picture or drawing is to be reproduced. When the picture obtained with the gelatine is dry, it is hardened by any suitable known means.

It is at this stage of the process that the novelty of our invention begins. By means of an hydraulic press or other variable pressure, we compress (in the state of heat and malleability required by the product employed) the picture formed on the gelatine, and composed of hollows and reliefs, on to a plate or leaf of celluloid, xylonite, phibrolithoid, or any other suitable substance with a basis of cellulose, and thus obtain on the said plate or leaf a reproduction of the picture or image on the gelatine.

We may also employ hardened caoutchouc, ebonite, or other combinations of vulcanized or non-vulcanized caoutchouc.

By this method or process we obtain, as described, a plate or cliché having surfaces either hollowed out or in relief, which may be used direct for printing on printing machines of various kinds.

16,327. John Urie, senr., and John Urie, junr., both of 83, Jamaica Street, Glasgow, Lanarkshire, Photographic Artists, for "Improvements in and connected with photography and the treatment of photographic prints or pictures."—Dated 13th December, 1886.

Our invention has reference to and comprises a new or improved mode and means or arrangement of mechanism for developing, clearing, toning, fixing, or other ordinary chemical treatment or washing of photographs, which have been previously exposed, and printed by artificial or other light in long lengths, bands, or webs of sensitised paper or fine surface cloth or other web fabric, all by and while traversing the said webs or bands at a constant regulated speed simultaneously through the required well-known chemical and other liquid baths required for the various purposes stated ; which improvements will produce work of more uniform excellence, and save much time and labour as compared with the modes and means heretofore in use for treating said photographic prints, singly or in short lengths containing a few prints, in the various baths at different times.

And in order that the nature and novelty of our said invention, and the manner of performing or carrying our improvements into effect or practice, may be properly understood, we have hereunto appended an explanatory sheet of drawings, in which the same reference letters are used to indicate corresponding parts in all the figures where shown. Figures 1 and 2 show a sectional elevation and a plan respectively, of one construction, or general arrangement and combination of the parts, of our improved mechanism for carrying out our said invention of continuously treating webs of photographic prints previously printed in long lengths, all in accordance with one arrangement of our improvements.

Referring to these drawings—the improvements of our said invention consist generally and mainly all as follows :—According to this arrangement and adaptation suitable for treating the photographic printed bands of paper, *a*, for book illustrations say from 12 to 15 inches or so broad ; we take the photographic

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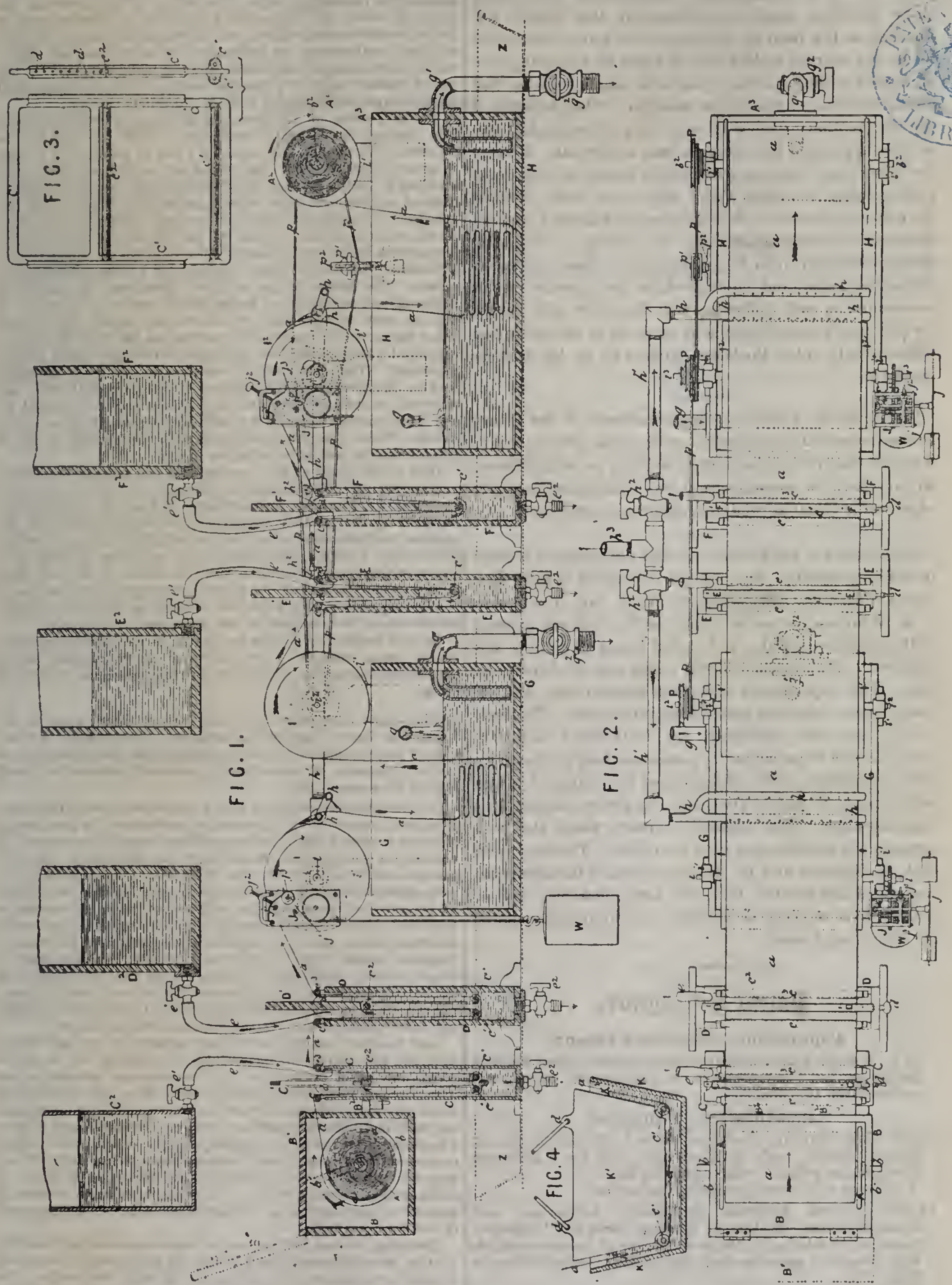


FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

bands, as printed in the photographic automatic printing machines, or otherwise, and wind them on to rollers A one at a time, having their spindles b put into journal bearings through slots b^1, or through the rollers A and bushes in a dark box B, carefully closed with a lid B^1, and it might be with black cloth, that no light can enter, and led forward to and through the new developing and treating process and arrangement of mechanism, all as hereinafter described. Or the printed bands a

might be delivered loose from the printing machine into deep dark boxes, from which the bands a may be removed to and passed through a pair of feeding-in rollers at the entering end B of the new arrangement of mechanism. In either case the web or band a of printed paper from the said dark boxes B or supply feed rollers, is led over guide and reversing rollers c, c^1, c^2, c^3, placed over and within the first or developing bath C, and then through the other treating or clearing, toning, and fixing baths D, E, F, ranged in their proper sequential order in advance of each other, as required to be used, on a table or platform, which might be in the form of a tray, as indicated at Z, to receive and convey away any liquid that may be spilt. The chemical baths C, D, E, F, would preferably be constructed in a deep narrow form for getting the greatest and best action of the chemicals with economy of materials, and so that the deposit would settle to the bottom and not pervade the whole bath and be easily drawn off; while the traversing of the web of paper a would always cause a motion of the liquid which would also aid in maintaining the liquids in the baths in an uniform strength and state throughout for action. The web of photographs a would in this way be led over the said upper guide rollers c and down under the rollers c^1 c^1 in the lower part of the baths and over a roller or rollers c^2 at the upper part of the bath within the liquid, and out over an upper guide roller c^3 of the various baths, and may be thus undulated up and down one, two, or more times within the baths to give a longer or shorter time of treatment within the baths, as within the first or strong bath C, which takes longer than either the second clearing bath D, or the after toning or fixing baths E, F, in which latter E, F, the paper a is shown as only making one undulation under a roller c^1, at the bottom of the moving frames E^1, F^1, and it might be also under rollers in the intermediate washing water baths G. H, although this is not prefered. Beyond the fixing and clearing baths C. D, a drawing and delivery drum or roller I would be mounted by its central shaft i in journal bearings in side frames or brackets i^1, preferably mounted in a portable form over the first cistern G of washing water, so that the web a of photographs would be led over the sides and upper surface in a moist state from the clearing bath D, and be delivered down into the water washing cistern G on the front side of the roller I. The drawing drum I would be considerably larger than the width of the widest paper a, to be treated, and preferably large enough in diameter to give sufficient circumferential surface that it could draw the web paper a over the guide, and immersed rollers of and through the several baths C D by the gripping action of the wet paper on the surface of the drawing roller I, and deliver it into the water of the washing bath G below in undulations over each other as shown. But for large machines and wide webs of paper, weighted drawing rollers might be laid on top of paper and drum to assist the gripping action. This drawing and delivery drum I, which pulls the paper through the machine, would be driven either by motive-power machinery, or it might be clockwork as shown at J, or other gearing, actuated by weights W or springs at an uniform time speed, regulated as desired by the driving cone pulleys P when motive bands p are used as shown on the spindles i^2, i^3, of the succeeding drawing drums I^1, I^2, and the spindle b^2, of the delivery roller A^2, carrying the web of paper a, subsequently through the baths E, F, and second washing trough H; or it might be by speed controlling small oscillating or sliding fan blades j; or it might be by a friction pressure spring or brake j^1 with controlling pressure screws j^2 acting on a pulley j^3 on the high speed gearing J^1 of the weight or spring clockwork mechanism J, J^1, when that is employed; or a shifting pendulum might be used on an escapement motion, or other equivalent governor which would regulate the velocity of the gearing J^1, to actuate the drawing and delivery drum I, at the desired speed the paper a was wished to be drawn through the baths for the time being. To further regulate the time the paper web and prints a would be under treatment in the several baths to perform their respective operations, the undulating and guide rollers c^1, c^2, immersing the paper within the baths, may be mounted on portable frames C^1, D^1, E^1, F^1, which can be raised and lowered into the baths to give a longer or shorter time traverse of the material through the baths; either fixed by pins at d, in the sides of the trough, or these trays might be carried by counterbalancing cords and weights over pulleys above, so as to instantaneously raise and lower them within the baths. One of these immersing frames C^1 is shown in detached side and end elevation in figure 3; or the baths might be fitted with movable siphons, which would regulate the height of the liquid within the baths higher or lower, to act on the paper for the greater time length of the traverse of the paper a, through them, and although this is not seen in the modification shown in the illustrated drawings. Or by another arrangement in some cases the paper a, on leaving one bath might be passed over a movable raising and lowering guide roller before allowing it to enter the next bath; or by an equivalent arrangement the baths might be removed further from each other, and in either case allow the paper photographs to be under the action of the chemicals in the last bath for a longer period, after leaving one bath before entering the next.

Any of these arrangements might give a nice adjustment as to seconds of time under which the photographic prints might each be under treatment within the respective baths: while the speed at which the drawing and delivery drums actuated the paper, might regulate a mean speed of the traverse of the paper, which would suit the treatment in the baths generally for being otherwise regulated, as stated within the individual baths.

Although deep narrow treating baths have been described as being generally preferable, for giving longer chemical action or treatment with the least amount and waste of the mixtures or liquids employed, yet other forms of baths might be employed to give the same effect, as by making a wide broad bath K, and immersing an inverted close hollow vessel K^1 within it as indicated at Figure 4, with guide rollers c^1, at its under edges or angles to keep the paper a immersed, and clear of either the lower or upper vessel while passing through the liquid, the immersion of this upper vessel K^1, which might be hung by cords, and counterweights or pulleys at d^1, so as to immerse it to any desired depth within the bath K, raises the liquid higher or lower within the narrow side spaces K^2 through which the web a was made to travel, thus giving a longer or shorter action of the chemicals on the paper. For giving a more uniform strength of the chemicals and action in each bath, a cistern C^2, D^2, E^2, F^2, of the mixture would preferably be mounted a few feet or so above the top level of their respective baths C, D, E, F, and a rubber or other pipe e led down to each bath from its cistern above, each controlled by a small tap e^1 to regulate the supply of liquid to the upper part of the bath, and keep a motion of liquid through the bath. An equivalent lower cistern would also be fitted below, each bath, although not shown in the drawings, for allowing the overflow liquid from each bath to pass down to the lower cistern, the liquid from which might be occasionally removed, or forced up by air pressure into the upper cistern to keep up the constant current through the bath. For this purpose a drawing-off pipe or syphon might be used to regulate the height of the liquid within the bath, although not shown in the drawings, or taps c^2 may be fitted at the lower of the baths to regulate the drawing-off of the liquid or the sediment into the said lower receiving cisterns.

Although only one drawing and delivery drum or roller I has been described, other intermediate drawing rollers I^1 I^2 would be employed to lessen the strain on the web of paper a while passing through the machine to the subsequent baths and washing troughs E, F, and H; these secondary drawing rollers being driven at the same speed as the first I either by clockwork J, J^1, as shown actuating the drum I^2, or by bands p and cone reducing speed pulleys P, which bands might be tightened by a movable spring or weighted pulley as shown at p^1 steadied in a guide p^2 to regulate the driving tension on the web of paper a, and allow the bands p to slip on their pulleys P when the strain on the paper becomes too great; and tension cords, or friction springs or levers such as j^1, j^2, shown on the clockwork J, J^1, might be employed on the spindle b, or a pulley on the spindle b, of the supply rolls or rollers A to regulate the tension, and keep the web a tight while passing over its guide pulleys.

Referring to details of the operation and arrangement of parts not yet referred to:—The continuous traverse developing operation with this arrangement of machine can be done all as indicated by the arrows in fig. 1, in daylight to observe the effects and get perfection of results at the various stages, the dark box B, B^1, into which the web of paper a is put, is preferably portable and removable as at B^2, for being removed to a dark room, and having the roll of printed paper A, a, inserted into it, and replaced from time to time, as used up. The developing bath C may be made of metal such as sheet iron, as the usual chemical salts of oxalate of potash or sulphate of iron do not materially affect this. But as the usual chemical salts employed in the clearing, toning, and fixing baths, D, E, and F, such as sulphuric or acetic acid, or alum, chloride of gold, or calcium, and the hypo-sulphite of sodium respectively, would act on metallic baths, it is preferred to construct these of wood, or wood coated with gutta-percha, or of vulcanite or porcelain, which would resist the action of these chemicals, and so not deteriorate the mixtures in the baths and the action on the paper. But the washing troughs G and H might be made of wood alone, or wood lined with zinc or other metal for ease in cleaning. And the water would be led to the upper part of these troughs by tubes as indicated at g, fitted with regulating taps, not shown in the drawings, and be drawn off by a siphon, at a fixed height as indicated at g^1, also controlled by a tap at g^2, as seen and indicated by arrows in fig. 1. For the better removal and treatment of the damp web of paper a being delivered into the troughs G and H from the drawing drums I and I^2, water is preferred to be played on to it, both in the upward and downward directions on opposite sides, from a perforated forked tube h, h, between the forks of which the paper is made to pass, leading the water from service pipes h^1, h^1, controlled by taps h^2 from a common supply pipe h^3, as particularly seen in fig. 2. But the driving drums I, I^1, I^2, might, in some cases, be partially immersed in the water within their troughs G and H, which would also facilitate the removal of the paper from the drawing rollers.

Although we have only shown the web of paper a regularly and continuously drawn through the machine by weighted clockwork, small water pressure or other convenient motive engines might be used, of which the speed could easily be regulated, driving the spindles of all the drums by light friction cords as p, the driving tension of which would be regulated on their pulleys to slip before the strain was too much for the damp web of paper being drawn through the machine. The paper after passing through the machine would preferably be wound up and delivered in a wet roll at A^2, after being thoroughly washed in the last trough H, which might be made of any desired length for thoroughly washing the chemicals out of the paper, before being so rolled up; and the rollers A would be removed successively as each web was treated and rolled up, to be unwound in a drying room over cords or otherwise; or otherwise, instead of the paper being so rolled up in rolls, it might be conducted over a guide roller at the end of the machine A^3, and conducted into a drying room adjacent to this developing mechanism, over rollers or traversing carrying cords.

And although we have only referred to treating prints on webs of paper, it will be understood that the prints might be made on webs of cloth or other web fabric, and treated all in an equivalent manner. And that although we have described the arrangement of the mechanism for completely treating the fabric from the beginning to the end of the process, it will be understood that any section of this process may be taken and treated separately, such as toning and clearing the web in a continuous manner, and rolling the paper up in rolls at I^1, after being thoroughly washed in first water trough G; and afterwards taking those rolls and treating them in a separate machine in a continuous manner for toning and fixing in baths as E and F and trough H, as a separate division of the process.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1st. The construction of a machine or general arrangement and combination of the parts, of mechanism for chemically treating, or developing, clearing, toning, fixing, and washing photographic prints or pictures traversed at a regulated speed continuously in a web or band of paper, or other web fabric, all substantially as herein described in reference to and shown in the accompanying drawings.

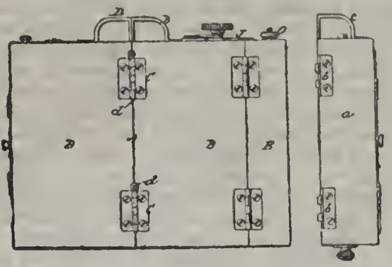
2nd. For the chemically treating and washing of photographs in a continuous web or roll, the use of drawing and delivery drums, driven at a regulated speed for carrying forward the web of paper, either with or without spray jets of water for removing and delivering the paper from the surface of the drawing drums, substantially as herein described, in reference to and shown in the accompanying drawings.

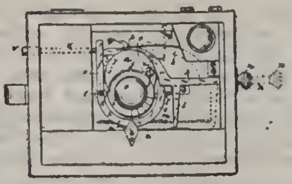
3rd. For the chemically treating of photographs in a continuous web or roll, the traversing of the web through deep or other baths which would regulate the duration of time the web was under treatment, substantially as herein described, in reference to and shown in the accompanying drawings.

Patents Granted in America.

371,453. John J. Higgins, New York, N.Y., assignor to E. and H. T. Anthony and Company, same place, for "Photographic camera."—Filed July 13, 1887. Serial No. 244,137. (No model.)

Claim.—1. A portable photographic-camera box having a vacant unoccupied space internally adapted to receive plate-holders used with the camera, the said box being divided between the lens and the exposure plate, whereby it may be opened and the said space utilised for the reception of plate-holders or other accessories, substantially as set forth.





2. A photographic camera made in two or more parts divided between the lens and the exposed plate, whereby the box may be opened for the reception of plate-holders, and provided with ribs, grooves, frames, or equivalent devices for the holding and retention of the plate holders, said plate-holders being outside the field of view, substantially as and for the purposes set forth.

3. A photographic camera, the box whereof is made in two or more parts, the division or divisions occurring between the lens and the exposed plate, whereby the interior space of the camera box may be utilised for the reception of plate holders or other accessories, and a detachably-attached lens-holding part or frame, whereby a lens of one character may be replaced by a lens of a different character, substantially as set forth.

4. The described improvement in camera-boxes, consisting in two or more lens-holding parts or frames, each provided with detachable connecting devices which engage with counterpart connecting devices on the body of the camera, whereby lenses of different foci may used in connection with the same camera box, substantially as set forth.

5. The combination, in a camera, of a pivoted light-excluder L, and a sliding button O, outside of the camera which engages with the light-excluder excentric to the pivot by means of a spindle passing through the side of the camera-box, substantially as and for the purposes set forth.

6. The combination, in a camera, of a push-button projecting beyond the side of the camera opposite the door through which the plate holders are introduced in the rear of the camera, the inner end of the push-button engaging with the edge of the plate-holder when in position within the camera, whereby the plate-holder may be started outwardly from the camera by applying pressure to the push-button, substantially as set forth.

7. The combination, in a camera, of a pivoted shutter provided with a light-admitting aperture, a sliding lever or rod operated from the exterior of the frame and engaged with the shutter for its rotation, a spring put under tension by the rotation of the shutter, a spring-catch which engages with notches on the shutter, and holds it against the stress of the spring, and means for releasing the catch, substantially as set forth.

8. The combination, in a camera, of a pivoted shutter provided with a light-admitting aperture, a sliding-lever or rod operated from the exterior of the frame and engaged with the shutter for its rotation, a spring put under tension by the rotation of the shutter, a spring-catch which engages with notches on the shutter and holds it against the stress of the spring, and a rod or lever operated from the exterior of the frame for the release of the catch, substantially as set forth.

371,855. Peter E. Rudell, New York, N.Y., for "Photographic plate holder."—Filed August 29, 1887. Serial No. 248,187. (No model.)

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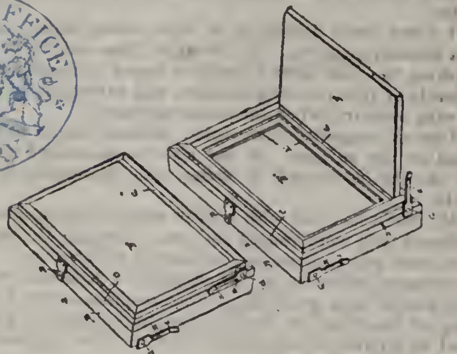


Claim.—1. A photographic plate-holder consisting of two sections hinged together and provided with swinging lids or covers, substantially as set forth.

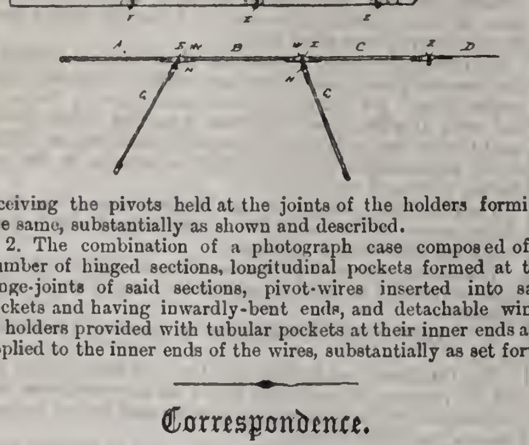
2. The combination, with the sections composed of open frames, of the bars journaled in the side bars of the sections and the lids mounted on said journaled bars, substantially as specified.

3. The combination, with the sections composed of open frames, of the bars journaled in said frames, the lids mounted on said bars, and the spring-levers secured upon the ends of said bars, substantially as specified.

4. The combination of the frame having a stop on its side, the swinging cover having an extended journal, and the spring-lever secured on said extended journal and engaging the stop on the side of the frame, substantially as specified.

372,052. Rudolph Wilhelm, New York, N.Y., for "Photograph case."—Filed April 16, 1887. Serial No. 234,991. (No model.)

Claim.—1. The combination with a photograph case constructed with hinged photograph-holding sections, of pivots held in said case at the joints of the sections, and additional wings provided along the inner edges with tubular pockets for receiving the pivots held at the joints of the holders forming the same, substantially as shown and described.



2. The combination of a photograph case composed of a number of hinged sections, longitudinal pockets formed at the hinge-joints of said sections, pivot-wires inserted into said pockets and having inwardly-bent ends, and detachable wings or holders provided with tubular pockets at their inner ends and applied to the inner ends of the wires, substantially as set forth.

Correspondence.

WHY PREFER CARBON OR PLATINOTYPE ?

Dear Sir,—In your fifth notice of the exhibition of the Photographic Society, in your issue of November the 11th, I notice the following lines :—"As regards the other large photographs (enlarged by projection on the Eastman paper), we must confess they do not please us, and, moreover, when one makes a photograph about eight feet high, is it not a mistake to make it by the silver process? Surely, if worth while at all to enlarge to these dimensions, the carbon or platinotype process should have been adopted."

It seems to me that the above language hardly conveys to the photographic world a clear idea of the objections of the Editor, and as I believe your criticisms are intended for the elevation of photography, may I suggest that it would be interesting to explain satisfactorily why it is a mistake to make a print eight feet high by a silver process, also what advantages has carbon or platinotype for pictures.—Yours truly, W. H. Walker.

The Eastman Dry Plate and Film Company, 13, Soho Square, London, W., November 14th, 1887.

THE AMATEUR EXHIBITION OF THE LONDON STEREOSCOPIC COMPANY.

Sir,—In connection with our Third Annual International Amateur Photographic Exhibition, it will doubtless interest both your professional and amateur readers to learn that this Company has just paid the sum of £32 5s. to Mr. Harland, the secretary, in aid of the Photographers' Benevolent Association. This consists of the amount received for entrance fees, which were fixed at 2s. 6d ; but as we have sent out some thousands of circulars to amateurs setting forth the aim of the Association, we believe that we have benefited the Society to a far greater extent than the sum actually sent as above. The Exhibition will be open to the public on presentation of visiting card on and after December 7th, when, although no actual charge will be made for admission, visitors will be invited to place a small contribution in a box that will be provided for the purpose by the Association, and we trust we may thus be able to collect a further goodly sum from amateurs and others. S. M. Clark (Sec.)

THE NEW MAGNESIUM LIGHT.

Sir,—In this week's issue of the News you draw attention to the use of the "new" magnesium light—magnesium powder on gun-cotton. Whether this be new or not is, perhaps, a question. What I would draw attention to is the statement that no "fumes" are produced.

As a matter of fact, whenever gun-cotton is burned in the air, or when it is not doing much work, and consequently the gases not subjected to great pressure, some oxides of nitrogen are formed. The particular oxide formed is probably the one called nitric oxide (NO), in which we have the simplest relation of nitrogen to oxygen of any of the oxides of nitrogen. But this oxide on contact with atmospheric oxygen takes up a further quantity, forming the oxide N_2O_3, and perhaps another N_2O_4, but certainly N_2O_3, which on contact with water forms nitrous acid, which in its turn readily oxidises further to nitric acid.

Anyway, whenever gun-cotton is burned in the open air nitric acid is always formed to some extent, and it can scarcely be termed harmless either to breathe or for the goods in its immediate vicinity.

The process of formation of these red fumes may be seen by setting fire to a few grains of gun-cotton at the bottom of a tall glass cylinder, or some such vessel, and quickly covering the top with a card or glass plate after the flash, a red cloud will be seen to slowly form—most likely from the oxidation of NO. The formation of the red cloud is more rapid when the cover is taken away.

The atmosphere of the vessel is strongly acid after the gun-cotton has burnt.

When gun-cotton is detonated there is probably no oxide of nitrogen left. But we don't know about this point, and detonating gun-cotton would not be of much use for setting the magnesium dust or filings into action. I have found magnesium dust dredged across a spirit lamp or horizontally held over a Bunsen flame through fine muslin give a very fine illumination, with of course only the oxide of magnesium smoke.

W. R. HOPKINSON.

THE WRONG INITIALS.

SIR,—In mentioning my having been appointed to act as treasurer during Mr. Bird's absence, in your last week's number, you give my initials as H. H. To save possible complications in consequence, would you mind stating that they are as below?—Yours faithfully,

G. L. ADDENBROOKE.

9, *Mecklenburgh Square, W.C., Nov. 16th*, 1887.

Proceedings of Societies.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.

A SPECIAL general meeting for the final acceptance of the proposed alterations of the laws was held in the Gallery, 5A, Pall Mall East, on Tuesday, the 5th inst., JAMES GLAISHER, F.R.S., president, in the chair.

The minutes of the three previous special meetings were read and confirmed.

J. WERGE inquired whether all the members of the Society had been notified of the meeting that evening, as the atteudance he considered to be very small for such an important occasion.

The ASSISTANT SECRETARY had read the old rule dealing with the issue of special notices very carefully, and concluded that it was unnecessary to notify all the country members. He had therefore issued only 170 notices to those likely to attend.

J. WERGE said that as two members residing near him had not been notified he should move the immediate adjournment of the meeting.

The CHAIRMAN, under the circumstances, could not proceed with the business further, knowing that all the members had not received notice.

T. SAMUELS, on technical grounds, submitted that the notice should not have been termed "adjourned special general meeting." He proposed that in addition to notices being sent to every member, a copy of all the rules in the amended form be also sent out, so that everyone might have an opportunity of reading carefully the proposed alterations.

W. E. DEBENHAM contended that if the meeting was incompeteut to proceed with the business of a special meeting, it was not competent to confirm the minutes of the previous special meetings.

W. BEDFORD regarded the suggestion put forward by Mr. Samuels to supply every member with a copy of the proposed alterations as a very important one, and desired to second the motion.

A. PRINGLE inquired under what rule the secretary had acted in not sending notices to every member of the Society?

The CHAIRMAN: Rule 2.

A. PRINGLE: That is an exceedingly difficult rule to carry out. Could we not proceed with the business?

W. E. DEBENHAM said there had been various adjourned meetings. At one there had been an amendment which was a distinct contradiction to the rule as passed at a previous meeting. Was it competent for the general meeting to accept either one or the other?

The CHAIRMAN: The first rule referred to was discussed, but not passed. The final meeting will have power to accept or reject any rule.

Some discussion followed regarding the date of adjournment, several present desiring to proceed at once with the business. Ultimately, T. Samuel's motion was agreed to unanimously.

W. BEDFORD proposed, and T. SAMUELS seconded, that the meeting be adjourned until the date of the next ordinary meeting, December 13th. This was also agreed to unanimously.

The CHAIRMAN, in closing the proceedings, said the Exhibition had resulted in an excess of receipts over last year of £18. Nearly 900 visited the Gallery on the last night, the 14th inst.

LONDON AND PROVINCIAL PHOTOGRAPHIC ASSOCIATION.

A MEETING of this Society was held on Thursday, the 10th inst., at Mason's Hall Tavern, Coleman Street, E.C., J. TRAILL TAYLOR in the chair. Norman Macbeth, D. W. Allen, and Herbert Fry were elected members of the Association.

The CHAIRMAN handed round for inspection a new shutter designed by Mr. Perkin, jun., and known as the "Patent Plunge Shutter." The guillotine principle was adopted; the drop was of aluminium. Extremely rapid or slow exposures could be made, and either a pneumatic release or a trigger action was available.

C. H. COOK drew attention to some stains which appeared upon a finished negative. He thought these might be caused by washing the plate after fixing in a vessel contaminated with perchloride of iron reducing solution, and subsequently intensifying with mercury, when the stains appeared.

A. COWAN suggested that some solution might have been dropped on the surface. It was also recommended that the plates should be steeped in water, and afterwards in dilute cyanide.

H. M. SMITH had met with similar stains to those shown, but he believed they were caused by pyro; steeping the negatives in citric acid and alum was recommended in this case.

P. EVERETT, referring to the question of halation, remarked that it would be a good thing if plate-makers put a thicker coating of emulsion on their plates, in support of which he showed an interior of a cathedral taken in June, upon a thickly coated plate not backed.

The CHAIRMAN agreed with the experiences given at the previous meeting—viz., that putting any opaque substance in optical contact with the back was sufficient.

W. COBB inquired whether it was advisable to avoid halation altogether?

W. BEDFORD said the halation complained of was due to reflection from two surfaces of glass; with films the phenomena was absent; therefore did Mr. Cobb object to the use of films on that account?

W. COBB referred to natural halation.

The CHAIRMAN said that troublesome halation was undoubtedly due to reflection, and it was necessary a distinction should be made between it and natural halation of objects.

A. COWAN, as an illustration, pointing to the halo surrounding candle flames, said that the size of these varied according to the distance of the observer, so that in photographing halation of this kind, distance would have to be considered.

The subject of photographing rainbows was brought under notice, but no information was forthcoming,

J. JACKSON showed a collodion transparency made ten years ago upon a Liverpool dry plate. It had been fixed in cyanide and toned with gold. The peculiarity about it was that it showed two distinct colours very vividly—viz., red and blue. At the horizon the effect of sunset was well rendered with brilliant reds, distant rocks appearing of a bluish hue, the remainder being more or less grey. It was stated that the colours developed in toning, and there was no evidence of any artificial staining or other means of colouring applied. The result was examined with much interest.

L. MEDLAND showed a collodio-bromide transparency, developed with hydrochinon, in proof that warm tones could be obtained thereby. He inquired the cause of opaque comets in some of these plates, and was informed that the failure was due to dirt on the plates when coated.

C. HEINRICH TRINKS related his experience in working with the new eye-pieces, constructed according to Professor Abbe, of optical glass. He found the instruments gave a flatter field, and even if a little less light were admitted it was certainly used to the best advantage; moreover, there was no difficulty to be apprehended from any slight alteration in the spring during prolonged exposures.

The HON. SEC. pointed out that the only remedy was to warm the apparatus before use; with a fine adjustment he had not found any alteration to take place.

The CHAIRMAN inquired whether the peculiarities of the new glass were likely to be advantageous in portrait lenses of large diameter?

C. H. TRINKS replied that he saw no reason why it should not be so.

The CHAIRMAN said those who had not tried locket glasses for the purposes of projection would be surprised what admirable objectives they make for projecting such images as flies, &c. when a good light is used.

F. W. COX inquired if warm tones could be made on bromide paper by the use of hydrochinon.

J. JACKSON replied in the affirmative.

The CHAIRMAN said there was no difficulty in obtaining warm tones with ferrous oxalate, if what he might term waste products were used—viz., old developer.

A. Haddon wished an expression of opinion upon the validity of the new rules, whether they were in force or not. A show of hands was taken, and it was decided in favour of the revised rules being henceforth in force.

North London Photographic Society.

The annual dinner of this Society took place on Monday last the 14th inst., J. T. Taylor in the chair.

Besides the usual toasts, which were duly honoured and responded to, the proceedings were enlivened by music and recitations lasting up to a late hour. A novel feature was introduced, namely that of making an impromptu collection in aid of the Photographic Benevolent Association.

Camera Club.

On Thursday, 10th November, W. H. Hyslop read a paper entitled "Marine Photography," Lyonel Clark occupied the chair. The screens and walls of the room were adorned with pictures all bearing on the subject of the evening, a course which will be adopted in future, as, for instance, on the 24th, when "Enlarging" comes on for discussion. In the course of his paper Mr. Hyslop gave a general description of his apparatus and of his method of working his large camera at sea, and expressed an opinion that a certain amount of seamanship was requisite in photographing moving vessels from a vessel itself in motion.

A. Hamilton Clark followed with particulars of his experiences, and the discussion was carried on by G. Davison, C. Burton Barber, E. R. Shipton, Moens, A. Deed, J. F. Roberts, and Plomer.

The Chairman, in conclusion, gave an address upon the same subject, and explained a table he had prepared from a well-known formula for finding the distance (lens and plate being given) at which an object of a certain size would about fill the plate.

The subject for Thursday, November 24th, is "Enlarging," when D. P. Rodgers will read a paper, and Messrs. Austin, Lyonel Clark, Bolden, and others will arrange to follow and show examples. Meeting at eight p.m.

Derby Photographic Society.

The second indoor meeting of the winter session of this Society was held in their rooms, 33, Victoria Street, on Tuesday, Nov. 8th, when upwards of 50 members were present to witness a demonstration on "bromide enlarging" and contact printing given by Mr. Thomas Scotton (see page 725). The process, as deftly manipulated by Mr. Scotton, was much admired, both in the development of the enlargement, and in the printing of pictures from small negatives by the aid of an ordinary gas flame.

Discussion upon various questions ensued, and votes of thanks were passed to Mr. Scotton for his excellent paper and demonstration, and to Mr. Keene for presiding.

Photographers' Benevolent Association.

The Exhibition of the Photographic Society of Great Britain was opened on 11th inst. for the benefit of the Benevolent Association, and was exceedingly well attended.

T. Sebastian Davis, addressing the assembly prior to the lantern display, said, on behalf of the Committee of the Photographers' Benevolent Association, he desired to express gratification that such a large number of ladies and gentlemen were present that evening, thereby showing a wide-spread sympathy with the movement. He briefly alluded to the objects of the Association, especially its important function of as far as possible procuring employment for members as the best means of preventing them falling into a needy condition. The Society, he said, founded in 1873, had of late made rapid strides. Since they met in the Exhibition Gallery last year, all present would be interested to learn that no less than one hundred and forty new members had been elected. He was glad the Photographic Society of Great Britain fully recognized the claims of the Benevolent Association, and gave the Committee a helping hand. He considered it the duty of every photographic society in the country to help forward the Association by strengthening the hands of the Committee.

Slides lent by the following gentlemen were then shown on the screen :—Messrs. Wilson, Short, Davison, Samuels, Briginshaw, Klosz, H. M. Smith, G. Smith, England, Freshwater, Pilkington, and Hastings. Messrs. Briginshaw, Clifton, and Mackie acting as lantern committee.

At the conclusion, Professor W. F. Donkin projected an image of the electric arc, used in the lantern, on the screen, and gave a lucid explanation of what takes place at the carbon poles in the production of an intense electric light.

T. Sebastian Davis, in terminating the proceedings, thanked the visitors for their presence, and hoped they had enjoyed the display of so many excellent transparencies. He desired to tender the thanks of the meeting to those gentlemen who had kindly lent slides, and to the Council of the Photographic Society for the use of their Exhibition.

These remarks were received with much applause, so also was the announcement that three hundred and seventy persons had passed the turnstile that evening, meaning a considerable addition to the funds.

Glasgow Photographic Association.

The opening meeting of the session was held on November 3rd, in the Philosophical Society's Rooms, William Lang, jun., presiding.

Andrew Bryce was admitted a member.

The President now vacated the chair for the purpose of delivering his opening address, and the Vice-President (A. Robertson) occupied the chair during the rest of the meeting.

The subject of Mr. Lang's address was "Photography on the Continent," and, being illustrated by examples of lichtdruck, phototype, and photogravure prints, proved exceedingly interesting. Mr. Lang, as convener of the Photographic Section of the Glasgow International Exhibition, 1888, was delegated to proceed to the principal cities on the Continent for the purpose of procuring exhibits. He therefore gave a graphic account of his travels; the various towns he had visited; the men well known in photography, such as Vidal, Stebbing, Liesegang, Obernetter, Otto, &c., he had come in contact with; the studios and photo-engraving works he had been kindly permitted to see through, and many little things which occurred *en route;* the whole proving very interesting and racy, and was thoroughly enjoyed by all present.

In the course of his Presidential address, Mr. Lang said : Since last we met two honoured names have passed away—Tunny, of Edinburgh, and Robert Hunt, F.R.S., of London. With the former many of our members had a personal acquaintance, while the fame of the latter was not confined to our own shores. What man interested in photography is there who has not heard of "Hunt's Researches on Light?" Nor is his "Manual of Photography" to be reckoned as worthy of less notice than the "Researches." True, it has been superseded by other treatises and other manuals, but this has been due to the progressive nature of our art. This manual went through many editions and it is interesting to note that the publishers were a Glasgow, firm, Richard Griffin and Co., and formed a volume of their "Encyclopædia Metropolitana." The later editions of Ure's "Dictionary of Arts, Manufactures, and Mines," were edited with Hunt's name attached. Hunt for many years has not identified himself with matters photographic. That the work he has done still bears good fruit, I may perhaps be permitted to state the fact, that while at Vienna Dr. Eder mentioned to me that although he had access to Hunt's "Researches on Light" in one of the public libraries in Vienna, he had not, so far, secured a copy for himself. I told him on my return to Glasgow I would be able to put this right, and accordingly, having picked up a copy at a second-hand bookshop, I posted it to him without delay. One word more regarding the "Researches," and I am done; and it is this, that there is no work in our own or any other language that is so full of suggestive material for the photographic experimentalist, and that, although it is now thirty-three years since the first edition was published, much of the original matter therein brought forward by the author has never further been added to. It may not be without interest to state that at the first meeting of the first Photographic Society in Glasgow, with the late Sheriff Bell in the chair, Hunt was present. The date of this meeting was March 8th, 1854, on which occasion the late Jabez Hughes read a paper on "The Prospects and Progress of Photography." Before passing on to the more immediate subject matter of my communication this evening, perhaps I may be allowed to refer for a moment or two to those classical researches of Carey Lea's which have been published during the term of recess, nor do I purpose taking up your time by going into the production of the coloured compounds to which Lea has given the name of photo-chloride, photo-iodide, and photo-bromide of silver. It will be within your recollection I discoursed on these in my paper at the Convention, but simply to refer to a later communication in which Carey Lea described what he called "image transference." This consisted in taking paper covered with a salt of silver, other than a haloid salt, say a tartrate, and exposing to light, and afterwards in the dark room applying a solution of hydrochloric or hydrobromic acid, then a solution of dilute nitric acid, to be followed by washing. On applying the developer the effect produced by light in the first instance was made manifest. I have always been expecting to see some English experimentalist going into these matters, and giving us some further insight into these unlooked for phenomena. Another most interesting experiment brought forward by Carey Lea for the first time, is that of the application of a solution of sodium hypophosphite, which works the same change upon a silver haloid, giving a developable image exactly as if the salt had been exposed to the impact of light. It has been ascertained that the salt in question acts in no way as a developer, and the outcome of the whole of Lea's work may be briefly set down as an attempt (and I think a successful one) to establish the identity of what is known as the latent image with the coloured photographic compounds, produced in quantity by the various methods detailed in the original memoir.

At the close of the address he handed round a detective camera of foreign make for going inside the vest, the lens protruding through a buttonhole, and being provided with a shutter for snap shots.

Through the kindness of Mrs. Baden-Pritchard, the first picture procured by the action of light by Niepce was handed round. This picture, done in 1827, had been brought by Niepce to this country to illustrate his paper read before the Royal Society, and had been presented by him to the Secretary of the Royal Society, and after a time had fallen to the late Mr. Baden-Pritchard at an auction sale. The original memoir of Niepce that had been read at the same time when the picture was exhibited, was also handed round, and, after the members had examined both, a hearty vote of thanks was accorded Mrs. Baden-Pritchard for her kindness in allowing this interesting relic to be exhibited.

Leicester and Leicestershire Photographic Society.

A meeting was held in the Mayor's Parlour, Old Town Hall, on Nov. 9, President G. **Bankart** in the chair.

Mr. **Wilkinson** gave his promised demonstration on bromide printing and development, more particularly with reference to double printing from cloud negatives. In his opening remarks, he premised that he was unable to understand why amateurs so persistently stuck to silver printing, when the beautiful results which the bromide papers gave could be obtained with ease and success. Carbon and platinum printing, both giving results excellent in their way, could only be practised by daylight, while the Eastman bromide papers, with little attention, would give results equalling either. In proof, he proceeded to demonstrate, by printing by gaslight from a somewhat dense negative of Tintern Abbey; and by an arrangement of masks, roughly cut out of paper, and registered in two frames, he inserted in the print a double print from a separate cloud negative, the result showing an admirably exposed print with the clouds faithfully rendered.

Birmingham Photographic Society.

The usual fortnightly meeting was held in the Technical Schools, Bridge Street, on Nov. 18th, A. **Pumphrey** in the chair.

John Graham Keys was elected a member, and A. Robinsou was nominated for election.

The **Hon. Sec.** (H. S. Pickard) read letters from R. Godfrey offering a paper subject "Don't," from E. H. Jacques' subject "The Land of the Midnight Sun"; from W. Tylar, subject "Double Contact Printing as applied to Lantern Slides; and prizes were offered by A. Constautine, F. Hoskins, E. H. Jacques, and W. Tylar, the first-named mentioning as competition for his prize, "Stereoscopic Work," saying he thought this class of work had been sadly neglected of late years.

A number of frames filled with very fine photo-micrographs on Eastman bromide paper were shown by J. F. Hall Edwards.

E. C. **Middleton** then gave his paper on "Collotype and Photo-Lithography." He exhibited a fine collection of collotype prints, and explained the process of their production, from the taking of the negative to the finished prints. He then went more fully into the process of "Photo-Lithography," and successfully inked-up several transfers from lined subjects. Afterwards he entered with great minuteness into the carbon process, and gave a practical demonstration, from the sensitising of the tissue to the finishing prints, including development on opal and paper. In the course of his remarks he mentioned the ease with which these can now be done from the Eastman Stripping Films, through being able to print from either side of the film negative. Single transfer is only needed, thus obviating the extra trouble and time taken up by double transfer.

Birkenhead Photographic Association.

The annual meeting was held in the Free Public Library on Thursday, the 10th inst., J. A. **Forrest** in the chair.

The following gentlemen were elected officers for 1888 :—

President : John H. Day.

Vice-President : Paul Lange.

Treasurer : Edward Whalley.

Auditors : F. Evans and A. W. Cornish.

Council : A. W. Beer, B. J. Sayce, G. A. Kenyon, M.D., J. A. Forrest, H. H. Williams, W. P. Riley, R. W. Hill, H. Lupton, P. H. Phillips, and T. C. James.

Secretary : George A. Carruthers, Woodhey, Rock Ferry.

A hearty vote of thanks, proposed by A. W. Beer, and seconded by B. J. Sayce, was tendered Mr. Forrest for his indefatigable exertions on behalf of the Association, in which both gentlemen spoke of his unvarying courtesy and *savoir-faire* during the three years he had occupied the chair.

In replying, Mr. **Forrest**, among other matters, alluded to the fact that he was then celebrating *his* jubilee of photography, and handed round photographs of several pioneers of the art, *collaborateurs* with himself when he first commenced his practice.

The annual report and Treasurer's accounts were read and passed, the latter showing a balance in hand to the credit of the Association of £11 2s. 10d.

The resignation of the Vice-President H. N. Atkins, through failing health, was received with regret, his labours on behalf of the Association being highly appreciated.

The annual competition prints were handed in during the evening, the new medals of the Association offered as prizes having apparently a favourable influence on their number and quality as compared with previous years. The Judges, G. E. Thompson, P. Hartley, and H. J. Whiteside, unanimously awarded the prizes as follows: Silver medals : "Best picture," John H. Day; "Best set of pictures," H. Lupton. Bronze medals : "A Pretty Face," George A. Carruthers; "Village Street View," A. W. Beer; "Flower Study," James A. Forrest; "Instantaneous," H. Lupton; "Animal Study," George A. Carruthers; "Winter Scene," Paul Lange.

The number of competitors in comparison with the strength of the Association not being as large as they should be, it was felt that the present mode of awarding the prizes, viz., for previously selected subjects, was capable of improvement. J. H. **Day**, therefore, to test the feeling of the members on the subject, brought forward the following recommendation :—"That the, system which has hitherto prevailed of selecting special subjects for annual competition be abolished, and that in place thereof a silver and bronze medal be awarded for the best set of six pictures respectively, irrespective of subject or size, which may be sent in upon a date selected by the Council, of which due notice be given upon the circular." The proposal was passed.

In reference to the above plan of giving medals for the best pictures of six specially selected studies, Mr. **Sayce** said he had always considered such a practice was no test of skill on the part of the prize winners, but that success in such competitions was principally attributable to opportunities of securing such subjects under the most favourable circumstances; and those who had most time and funds at their disposal had a much better chance of carrying off the medals than others who, perhaps more skilful, did not possess the advantage of liberty to roam in search of models. In athletic competitions, for example, all candidates for the prize must be present when the moment for trial arrives; prizes for a race are not awarded to those who run the same distance in different localities, but all must assemble at the same spot and do their best, under fixed conditions, to secure the coveted prize. He considered that the only fair way of awarding a prize for best work of a society was to have a day and *rendezvous* appointed when all desirous of ascertaining their relative position as photographers should assemble, and, no matter what might be the state of the weather--fine, windy, wet, or foggy—each should do his utmost to arrive at the best photographic and artistic reproduction of the neighbourhood selected; all conditions being thus equal, the award to skill would be more truly granted.

After considerable discussion as to conditions, in which Mr.

Beer suggested that the number of exposures should be limited to six, Mr. **Sayce** proposed the following resolution, which was seconded by Mr. P. **Lange** and carried : "That on a given day, and at a given *rendezvous*, members of the Birkenhead Photographic Association shall meet for the purpose of testing their skill in photography and artistic treatment of subject, and that on such occasion only six exposures shall be made by each competitor, and a resulting print from the untouched negative of every exposure shall be handed in by the competitor at the second ordinary meeting after such outdoor meeting, and that the Judges shall award a silver medal for the best and a bronze medal for the second best set of six exposures."

CARDIFF AMATEUR PHOTOGRAPHIC SOCIETY.

The November meeting was held on the 4th inst., President S. W. **Allen** in the chair.

Messrs. Horton, Travers, F. Thomas, and W. H. Thomas were elected ordinary members.

A further communication was read from the Town Clerk *re* National Institute for Wales, and Messrs. Allen and Kellar were deputed to watch the interests of the Society.

The second annual meeting was afterwards held, when the report was adopted, and officers for the ensuing year elected as follows :—

President—Alex. Kellar.
Vice-Presidents—H. Dyer and S. W. Allen.
Honorary Treasurer—G. H. Wills, Junr.
Honorary Secretary—G. H. Bedford.

A private exhibition was also held, and although short notice had been given, a most interesting collection was brought together, embracing all the different processes. A chief feature was the enlargements shown, many of them being extremely well executed.

It is probable that either a public exhibition or *conversazione* will shortly be held.

Talk in the Studio.

Thought they were Bushrangers.—The Victoria Camera Club is the name of a new amateur photographic association, whose members go out every Saturday afternoon *en masse* to photograph pretty "bits." The other day a contingent of them were on their travels out Burwood way, when they came across a dilapidated cottage belonging to an ancient farmer of Burwood's primitive days. The shaky old place, half hidden with creepers, the cow in the bail, the stone wall broken here and there, and the old farmer and his wife busying themselves about, made just such a rustic composition as delighted the members of the Camera Club. "Halt !" cried the leader. "Unpack cameras—erect tripods—present lenses. Fire !" Just then the Burwood farmer looked up and saw an army of what he presumed were bushrangers levelling the barrels of their infernal machines at him. In an agony of terror he dropped upon his knees. "Oh, please Mister Ned Kellies," he cried, "don't shoot ! Take all we've got, the cow included, but spare our lives !" Explanations ensued, the farmer received a substantial tip, and the members of the Camera Club returned home happy, having taken not the life of the old farmer, but from the life a negative of him and his rustic dwelling.—*Melbourne Punch.*

Fire at Cardiff.—We are told that the meeting rooms of the Cardiff Photographic Society only just escaped destruction by a fire on the 13th inst., other rooms in the same building being destroyed.

London and Provincial Photographic Association.—Thursday, Nov. 24th, will be a lantern evening. Visitors are invited.

Photographic Club.—The subject for discussion on Nov. 23rd will be "Development." B. J. Edwards will demonstrate the working of a new process of development.

To Correspondents.

⁂ We cannot undertake to return rejected communications.

C. T. Palmer.—We cannot advise in the matter, but recommend you either to obtain the principal catalogues and judge for yourself, or obtain the "Photographers' Indispensable Hand-Book," published by Iliffe: this being an illustrated photographic price-book.

Sidals Road.—1. If he were an artist painter he would certainly know better, and it is easy to understand that one who lacks the most elementary notions of drawing should so far commit himself. 2. On the contrary, it is entirely due to retouching; unless, indeed, this word is used in a very restricted sense. 3. Very thin Rives or Saxe paper may be used, although if you have much work of this character, it will be just as well to find a cheaper material. A thin, close German paper, now largely sold for printing upon, has answered very well in our hands, but not less than five reams can be bought. We post you a sheet of this with particulars. 4. If the solution is too hot, it penetrates through the sizing in places, and causes patches where the image is less vigorous. 5. If he sells the foreign photo-ceramics under the pretence that they are his own work, he is liable to prosecution. 6. Next week.

C. T. Fox.—Not unless it is heated.

T. Jones.— It is probable that the dark slides are blackened inside with some material injurious to the plates. Cut a plate in two, put one portion in one of your old dark slides, and the other half in the new slide which you suspect, leaving both for some days; after which expose and develop both together. If the latter portion of the plate shows the markings which have rendered your journey fruitless, and the former is free from these markings, go to the commercialist who sold the apparatus, tell him what you have done, and demand from him a sufficient sum to cover all losses. At the same time, tell him you are willing for the experiment to be repeated in the presence of himself or of his representatives; but he must avail himself of this offer at once, as the mischievous effects of the black composition diminish with time. A commercialist calling himself a manufacturer of photographic apparatus, and selling you a tourist set which, by virtue of injurious material used, is absolutely unfit for the purposes of the photographic tourist, is legally responsible in full damages.

C. A.—Send it to the president of the Photographic Society of Great Britain.

Short Focus.—The plate has probably been placed in contact with some chemically active substance.

H. W.—It should be obtainable from any dealer in photographic chemicals; but if you have any difficulty, apply to Hopkin and Williams, operative chemists, Cross Street, Hatton Garden.

L. G.—1. Certainly it is not a suitable occupation for one so afflicted. 2. Difficult, but possible to a person of energy and talent. 3. Say two hundred pounds. 4. Perhaps twenty per cent.; but such an estimate depends on what you really include under the term. Of course a capitalist working in the business would take the equivalent of salary in addition to "profit."

Wm. Bartholomew.—A fixed alkali used as you suggest would so modify the gelatine as to cause fog.

J. H. P.—It is quite a common thing in the case of a full exposure for the image to show on the plate before development, but some plates are more prone to this kind of thing than are others.

W. A. Smith.—1. There is no English book on the subject, but the articles in the News cover the whole ground. 2. We really do not know who sells the best albumen paper, but that sold at full price by all the well known dealers is good. 3. We know of no method of obtaining such a surface, excepting those methods which you mention.

Henry Sturmey.—Thank you for sending us the paper and the cutting, of which we shall make use. As regards the other matter, we will write to you.

J. Y. C.—1. The wide-angle lens which is sold under the name you mention we have not seen, consequently we can hardly advise as to its merits 2. Everyone, like yourself, wants a lens which "will work very quickly and give all over with a large stop," but we have to be contented with a compromise between incompatible conditions. 3. For 8½ by 6½ ordinary work, get a rapid rectilinear or symmetrical of eleven inches focus; but for wide-angle work a portable symmetrical of six inches focus is the thing. 4. Like any other prints, the difference being on the side of the negative. There are many reasons why you should not commence working the wax paper process, and, as far as we can see, none why you should; unless, indeed, you do it as a matter of scientific interest.

Carbon.—1. Send a print, and perhaps we can help you. 2. The acetate serves to replace any hydrochloric acid by the weaker acetic acid. 3. A few days; that is to say, when usual bichromated gelatine substratum is used.

The Photographic News.

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For Advertisement Scale see page v.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1525.—*November* 25, 1887.

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THE CELLERIER-PARKES AFFAIR, AND THE PHOTOGRAPHIC COMPANY, LIMITED.

"PHOTOGRAPHING IN COLOURS" CLAIMED.

The following appears in the advertisement column of the *Standard* for Tuesday last, the 22nd inst., and a similar or identical announcement is to be found in other newspapers of the same date :—

The subscription list will open to-day (Tuesday) and close on or before November 25th, at 4 p.m.

The Photographic Company (Limited) (proprietors of the Cellerier-Parkes Colour Processes)—Incorporated under the Companies Acts 1862 to 1886, whereby the liability of the shareholders is limited to the amount of their shares. Share Capital £100,000, of which it is proposed to issue £75,000, divided as follows :—£25,000 to Cellerier's Syndicate (Limited) in deferred shares of £1 each, in part payment for the business, trade, premises, and plant, and which shares will not bear interest until dividends at the rate of seven per cent. per annum have been paid to the ordinary shareholders, and the remainder of the present issue being £50,000 in ordinary shares of £1 each, payable as follows, viz. :—1s. on application, 4s. on allotment, and the balance in calls not exceeding 2s. 6d., at intervals of not less than two months. *Directors*—George Augustus Sala, Esq. (chairman), 91, Victoria Street, Westminster, S.W.; Sir Oswald Brierly, F.R.G.S., and R.W.S., 38, Ampthill Square, N.W.; C. B. Birch, Esq., A.R.A., The Studio, Chelsea Bridge, S.W.; W. Flatau, Esq., Lusan House, Highbury Quadrant; J. L. Hale, Esq,, Director Government Stocks Investment Company (Limited); Edward William Parkes, Esq., Salters' Hall Court, E.C.; Melton Prior, Esq., Special Artist *Illustrated London News;* and two of the largest shareholders to join the Board after allotment. N.B.—No directors' fees will be paid until the shareholders have received dividends of seven per cent. *Bankers*—The City Bank (Limited), Threadneedle Street, London, and all its branches. *Solicitor*—F. Hill, Esq., 73, Queen Victoria Street, London, E.C. *Auditors*—Messrs. John R. Ellerman and Co., Chartered Accountants, 10, Moorgate Street, E.C. *Secretary* and offices (pro. tem.)—J. H. Hayward, Esq., 58, Lombard Street, E.C. *Abridged Prospectus*—This Company is formed to take over, extend, and carry on the undermentioned businesses, viz. :—1. The Cellerier's Syndicate, which includes the general photographic business at present carried on at 58, Pall Mall (opposite Marlborough House); 16 and 17, Poultry, E.C.; 37, Piccadilly, W.; 38, King's Road, Brighton; and printing establishment and manufactory at Sidcup, Kent. 2. Cellerier and Parkes' Process of Photographing in Colours, and which has been protected by Royal Letters Patent.

The Photographic Company (Limited).—The Company has purchased the business of Mr. Vernon Heath, who has acquired a well-earned celebrity for his photographs, enlargements, landscapes, &c. The English patent which will be acquired by the Company is one of photographing in colours, which not only embraces photography in general, but that of landscapes, animal life, and what is most important of pictures, which can be faithfully reproduced in fac simile colour at a trifling cost. For trade purposes the Cellerier-Parkes process is particularly valuable, and will doubtless receive most extensive patronage from the various traders, as by it registered marks designs, millinery, hats, carpets, furniture, and all other like objects can be reproduced in exact colour and form. *Times*, June 7th, 1887.—Another process for producing coloured photographs without the aid of artist's work, in the ordinary sense of the term, is being introduced in practical photography. The system originated with M. Cellerier, but has been developed and perfected by Mr. E. W. Parkes. The improvement effected by Mr. Parkes relates to the method of colouring, which process he has greatly simplified without impairing the effectiveness of the picture. As a whole the numerous examples illustrating this new departure in photography were satisfactory. *Times*, Nov. 18th, 1887.—The colours have all the transparency and brightness that can be wished. The profits of the Company will be derived from :—1. The ordinary photographic business, which will include the manufacture of dry plates, autotype, silver and platinotype, printing in all branches, and enlargements for the trade amateurs. 2. The photographs by the new process. 3. The granting of licences to provincial photographers, and from fees derived for instruction in the patent process, also from production of photographs in colour from negatives taken by professionals or amateurs. 4. For trade sample cards of furniture, millinery, and dressmaking, goods, hats, carpets, &c., in colours by the new processes. 5. The reproduction of oil paintings, water-colour drawings, and sketches. It is well known that the photographic business is very profitable, and the directors are satisfied that, in acquiring the very valuable patent referred to, and Mr. Vernon Heath's connection, they are securing a combination which will ensure very large returns to the shareholders. They have, in addition, obtained the services of Mr. Heath as manager at a nominal salary, with a percentage on the returns. The Company's coloured photographs can be delivered in the same time as generally elapses before the completion of the ordinary ones, and at only a trifling additional expense; the photographs are permanent, no surface colours or dyes being used. The following contracts have been entered into, viz.:—One dated 21st November, 1887, between the Cellerier Syndicate (Limited) of the one part, and the Photographic Company (Limited) of the other part; and one dated 21st November, 1887, made between the Photographic Company (Limited), and the London Scottish Mercantile Investment Trust and Agency (Limited) of the other part.

It does not certainly follow that because the names of the above-mentioned persons are associated in an advertisement with absolutely false and misleading statements that these persons should be held immediately responsible for such statements, as they themselves may have been misled, or the advertisements may have been inserted without authority. It is, however, quite open for any or all of those persons whose names are mentioned above to disclaim responsibility—a course which would certainly be wise.

We have nothing to do with the purely commercial aspect of the case, our duty to the public being complete when we have distinctly stated a claim regarding one technical matter to be absolutely false and untrue.

That which we have already written about the Cellerier affair will be found on page 343 and 353 of our present volume, and we withdraw nothing then said. In addition we say this :—

The following statement is a false one, and is, at any rate, calculated to mislead.

> "The English patent which will be acquired by the company is one of photographing in colours, which not only embraces photography in general, but that of landscapes, animal life, and, what is most important, of pictures, which can be faithfully reproduced in facsimile colour at a trifling cost."

A photograph which is first made by an ordinary process, and then coloured by a manipulator, who selects his tints according to his own eye and judgment, may, perhaps, be called "a photograph in colours," although many might be misled by such a term ; but to call the process of making such a coloured photograph "photographing in colours" is an absolute falsehood, amounting to a fraud if stated wilfully and in order to influence share-taking.

We hope to hear that all those whose names appear above have repudiated that which is untrue, and that they have procured the return of any money subscribed on the strength of the false statement. If they are not prepared to do this, they ought to prosecute us for libel.

PIFFARD'S METHOD OF USING MAGNESIUM FOR MAKING INSTANTANEOUS PHOTOGRAPHS AT NIGHT.

We now give the full text of Piffard's paper as read before the Society of Amateur Photographers of New York, on the 11th ult. Dr. Piffard says :—

Portraiture by artificial light resolves itself into the employment of gas, kerosene, electricity, calcium, or magnesium. With an abundance of either gas or kerosene quite satisfactory portraits may be made with an exposure of from one to three minutes, if care be taken in the arrangement of the lights, reflectors, &c. With the electric light exposure may be very much shortened, and portraiture by this means has already been placed on a commercial basis.

The calcium light is also capable of being used for portraiture, but the apparatus employed is bulky, expensive, and troublesome, and the results obtained are not sufficiently satisfactory to bring this method into use. Exposure required by the calcium light is longer than in ordinary daylight gallery work.

The intensely actinic light yielded by burning magnesium has been utilized experimentally, but not commercially, and has generally been obtained by the ignition of a small length of magnesium tape, either suspended free, or fed from a specially constructed lamp. It usually requires an exposure of fifteen or twenty seconds. This method is unsatisfactory, owing to the fact that the magnesium tape is apt to break, and the light go out before the exposure is completed. Powdered magnesium dropped from a funnel upon a burning lamp or other source of heat has not been found in practice to yield the results that were hoped for.

Quite recently Dr. H. W. Vogel has communicated the results obtained by him with the use of a photographic powder prepared by Gadicke. By this means he obtained an instantaneous flash of extreme brilliancy and actinism, and capable of fully impressing the sensitive plate. In other words, he succeeded in making instantaneous portraits at night, a feat which had not been previously accomplished. The exact composition of Gadicke's powder is, we believe, unknown, except to the inventor, but is supposed to be a mixture of magnesium, chlorate of potash, and sulphide of antimony.

Commenting on this mixture, the *British Journal of Photography* of August 26th says :—"The statement that it cannot be inflamed by pressure or percussions is difficult to believe, since most dangerous explosions have taken place with such a composition. Of course the materials must be ground separately and mixed gently, but even then, no matter how far the chlorate of potash may be diluted down, so to speak, with the other two substances, the statement that the mixture is safe against pressure and percussion is too serious, as well as too improbable, to be safely accepted on the authority of an anonymous newspaper paragraph."

The efficiency of the Gadicke light may be easily conceded, and is sufficiently attested by the eminent Dr. Vogel, and the only drawback to its use appears to be the danger of premature explosion of the powder, a danger that will be fully appreciated by those who are familiar with the behaviour of mixtures containing chlorate of potash.

Experiment has already shown that the light given out by the burning of ten or fifteen grains of magnesium is sufficient to fully expose a sensitive plate, and with the aid of a quick-acting portrait lens to yield a satisfactory negative so far as actinic effect is concerned.

In using magnesium tape, the ignition takes place gradually, and a time exposure is necessary. For instantaneous exposures it is requisite that the entire quantity of magnesium be ignited simultaneously, so that the full actinism of the light is developed in an instant. This Gadicke has accomplished, but by means which appear to be somewhat hazardous,

The problem that remained was to obtain a substance capable of instant combustion, and the heat from which would cause the simultaneous ignition of the magnesium, and which would be free from the dangers incident to the use of chlorate of potash. Such a substance is ordinary gunpowder.

If one part of gunpowder be mixed with four parts of magnesium powder and ignited in an open space, an extremely actinic light is instantly developed. This mixture is absolutely safe, as it cannot be ignited except by the application of fire, and will not explode by concussion.

Another simple method of accomplishing the same end is to take a small tuft of ordinary photographer's cotton, such as is used for making collodion, lay it on a metal plate, and strew over it a small quantity of magnesium powder. The cotton is then lighted with a match, and the heat developed by its combustion ignites the magnesium, and we have an instantaneous blaze sufficiently actinic to effect the desired result, as I will presently demonstrate.

It is not for portraits only that the method here described is applicable. Excellent copies of photographs or other objects can be made, and even enlargements on bromide paper.

In practice I have found that seven or eight grains of cotton, with from ten to fifteen grains of magnesium, will produce sufficient light for a single portrait or a small group. For copying, lantern slides, or even bromide enlargements, the same quantity may be used.

The methods here described are not the only ones by which the extremely actinic light of magnesium may be safely developed, as I have made several negatives by the flash of a pistol, the weapon being loaded with a mixture of gunpowder and magnesium.

In comparison with other methods of artificial illumination adapted to portraiture, this panactinic light, if I may be permitted so to call it, is characterized by extreme softness, a feature impossible to obtain with either a single electric or calcium light, or with the magnesium tape ; due to the fact that with these latter the light emanates from a comparatively small point, while the magnesium cotton light gives a large diffused blaze.

The prints which I exhibit this evening are from negatives which have been taken simply with a view to the demonstration of the actinic power of the light, and are to be judged from this, and not from an actinic standpoint. It remains for the professional photographer, skilled in the use of screens, reflectors, and other accessories, and familiar with the art of posing, to obtain the best results that this means of illumination is capable of producing.

In conclusion, I must extend my thanks to my friends Mr. Edward Leaming and Dr. P. M. Bradley for the kind assistance they have given me while experimenting with this process.

CAPTAIN PIZZIGHELLI'S NEW PLATINOTYPE PROCESS.

In the formula for the sensitizing solution, which appears in the paper on page 725 of our last issue, "grains" was twice printed instead of grammes, and readers likely to be interested in the matter should make the required correction.

The Sensitizing Solution is prepared as follows :—To the normal ferric-oxalate solution is added in the dark room, and keeping the dish rocking, as much of neutral ammonium or sodium oxalate as will just dissolve at the ordinary temperature. For this purpose will be required of the above-named salts :—

To normal ferric-oxalate solution...	100 c.c.
Neutral ammonium oxalate ...	18 to 20 grammes
Or to normal ferric-oxalate solution	100 c.c.
Neutral sodium oxalate	15 to 18 grammes

The following particulars are from a translation of the "Platinotypie" of Pizzighelli and Hubl, edited by Capt. Abney, and published at 2s. by Harrison, of Pall Mall.

Preparation of the Ferric-Oxalate Solution.

For the preparation of this solution of ferric-oxalate the following operations are necessary :—(1) Manufacturing the ferric-hydrate ; (2) dissolving that substance in oxalic acid ; (3) determining the amount of iron and of oxalic acid contained in this solution ; (4) diluting and acidulating the same.

The method of preparing ferric hydrate is generally well known, but for the sake of completeness we will give a brief description of it. Ferric chloride, 500 grammes, are dissolved in from five to six litres of water, and when the solution has been brought to the boiling point, solution of soda is added, until it gives with litmus paper a distinctly alkaline reaction. For this purpose about 250 grammes of caustic soda will be found necessary. The precipitate is then washed with hot water by decantation, until the wash-water is no longer alkaline. It is next placed in a cloth, and by pressure freed from the greater part of the water. With the ferric hydrate thus obtained, which ought to have a syrupy consistency, there should be mixed about 200 grammes of finely crystallized oxalic acid, and the mixture be then left to itself for a few days at a temperature of not more that 30° C., and in a place completely protected from the light; under these circumstances the formation of ferric oxalate will go on steadily. Some persons recommend the promotion of this process by digesting the mixture for some time at a high temperature. This we are decidedly opposed to, since, by heating for even a very few hours to 50° or 60° the salt will be partially reduced to a ferrous oxalate. At the commencement the solution has a pure green colour ; by continued digestion it turns yellowish-green, and finally greenish-brown. When this moment has arrived the remaining ferric hydrate should be filtered off, and the solution be submitted to a quantitative chemical analysis.*

Although the determination of the amount of iron and oxalic acid contained in the solution is one of the simplest of analytical operations, we tried at first to dispense with it. Closer investigation, however, proved to us how necessary it is to confine the relations between rather narrow limits, in order to insure the success of the platino-ferric process. Now as ferric oxalate cannot be prepared in a stable form, so as to have a constant composition, there remains no other way than that of determining the composition of the solution by analysis, and then diluting it to the required degree. Further, it should be noted that any quantity of the solution may be prepared at once, and then kept in stock.

From the analysis we ascertain the quantity of ferric oxalate contained in 100 c.cm. of the solution, as well as any slight excess of oxalic acid which happens to be present. The liquid is then diluted with so much distilled water that every 100 c.cm. of it may contain 20 grammes of ferric oxalate [$Fe_2(C_2O_4)_3$]. Crystallised oxalic acid is then added, until, with the free acid already in the mixture, that substance amounts to from 6 to 8 per cent. of the ferric oxalate already in the solution—the normal ferric solution.

IN NORTHERN LATITUDES WITH A CAMERA.

BY LEWIS MEDLAND.

On August 28th, 1887, the steamer yacht *Ceylon* left Gravesend on a cruise to the Baltic, enabling her passengers to visit Copenhagen, St. Petersburg, Moscow, Nijui-Novgorod, Stockholm, and Christiania. Besides a numerous proportion of "handled" personages, there were on board two humble members and an ex-member of the North London Photographic Society. The manager, Captain Peters, kindly arranged for a dark-room, and the locker, that it turned out to be, was soon ready after pasting some orange paper on the "scuttle." We should have started the day previous, but at the last moment something went wrong with the machinery. However, having had fog-horn music for an accompaniment part of the way, we anchored off Copenhagen on the 31st. My first exposure was on the Tre Kroner Fort, and then on a Russian ironclad. I developed these in order to get an idea of future exposures, and to my disgust found the ironclad was gaily sailing over the top of the fort. This was a bad beginning.

On going ashore with our cameras we were not molested by the Custom House officers ; the weather being bad, I only took one of the Kongens Nytorv (King's Square). Here I lent my companion my tripod, the screw of which I took out to allow his to be used temporarily. When he had done with it, my screw could not be found anywhere, so with difficulty I found out where another could be made ; and after using all the strength of what little I knew of French, German, and Dutch, with a smattering of English, made them understand my requirements. After some hours' patience I was furnished with a much better screw than my other. On reaching the ship again, my friend pulled out my old screw from his pocket. Consider the waste of eloquence ! The next day we went ashore with three cameras, two half-plate and one detective. We had had a good look round the day before, and had mentally noted the points of interest, and the best time of day for the exposure. The bronze statue of Frederick V., with the various palaces in the background, claimed our first attention, after which some very old Danish houses near the Marmor. Here a man addressed me, but as I could not understand a word he said. I put my head under the cloth and commenced to focus the other half of the Square; as he went away I supposed it was all right, and he was satisfied. After this the statue of the Danish Admiral, Niels Juel, was taken.

A very interesting shot was then made at the market with the peasants in their national dress. In the canal alongside were numerous barges laden with stoneware and pottery of all kinds. In taking a nearer view of the market, I was much impeded in the "out of focus" style of way by the younger branches of the Danes ; but with patience, and the sudden instinct of a better informed native, who spoke a few words to the crowd, I had a clear course. At the fish market I wished I had a "detective," as many an interesting group could have been taken of the old women in their curious caps and characteristic garments. However, I chanced a half-plate. I should here state that I myself had only a half-plate camera, with two pieces of tin, one for quarters and the other for narrow panoramic views; this arrangement obviates the necessity of carriers. My friend had a ten by eight, a half, and the detective. After this I had rather a difficulty in securing the most curious spire of the Exchange, formed by four twisted dragons, their heads at the base pointing N.S.E. and W.; not having my short focus lens with me, I could only get a small view of it, with the remains of the burnt Christianborg Palace in the distance. Another curious spire, that of Vor Frelsers (our Saviour's) church in Christianshavn was secured. A spiral external staircase winds round this spire, terminating under a ball. From the top it is said a magnificent view of the city and and suburbs can be seen. We did not venture up, as it was too stormy for camera work. Resting for a moment, we were soon surrounded by a host of Danish children of both sexes, and selecting a boy named Andersen, I made him understand I wanted a group; he tumbled to the situation, and a picture was obtained. The Smiths, Browns, Jones's, and Robinsons of Denmark are Petersen, Andersen, Nielsen, and Hansen, and one cannot go many yards down a street without seeeing several of these names on the shops. Returning by the King's Square, we came to the house wherein the Princess of Wales was born. Here my shutter refused to act, and I had to use my pockethandkerchief in lieu of a cap, and thus it was obtained. As we returned to the landing stage the Russian National Hymn was being played on board the Czar's yacht *Derjava*. You must excuse me giving it to you in Russian characters, as none of us could decipher it as we passed close by on our way to the ship. Most of the peasants wear sabots or wooden shoes, and one constantly meets children thus shod, and hears them as well, as they clatter on the pavement. I was certainly astonished at the facility afforded us for taking photos. The police, instead of moving us on for causing a crowd, moved the crowd on, so as not to inconvenience us. Next day I went early to the citadel and took a pretty little scene, a cottage at the extreme end of a large pool surrounded by trees. I then planted my tripod under the nose of a sentry, and took a view of the barracks. If ever I felt any doubts as to whether I should be allowed or not, I showed them my Newman's shutter, which seemed to puzzle them. During all this time I was focussing, &c., so that by the time they had seen enough of it I had taken my view unknown to them. Returning, I secured the Russian ambassador's house, and a view down the quay of old houses and shipping. Fearing that my handkerchief cap of yesterday might have been a a failure, I again took our Princess's birthplace. Strolling on to the Amalienborg I took a larger view of the Marmor, then one of the several palaces close by, after which a very superior class of the old Danish style of house, with its curious roofs. As we were leaving at noon for Cronstadt, I just had time to secure a fort with a crowned top, and as we left Copenhagen the Royal yacht *Osborne* from my cabin port hole. A few words about the Danes before dismissing Copenhagen. I found them steady, honest, polite, and exceedingly kind; in fact, one whom I saw outside the Hotel d'Angleterre gave me his card to the correspondent of the *Times* (English) at St. Petersburg, stating that he would give meevery information as regards the possibility of camera work in Russia. As it will appear afterwards, I was unable to avail myself of this introduction. All I can say to those who intend visiting Copenhagen, or probably elsewhere in Denmark, is that they can photograph to their heart's content with perfect ease and freedom, and at the same time, meet with the utmost courtesy.

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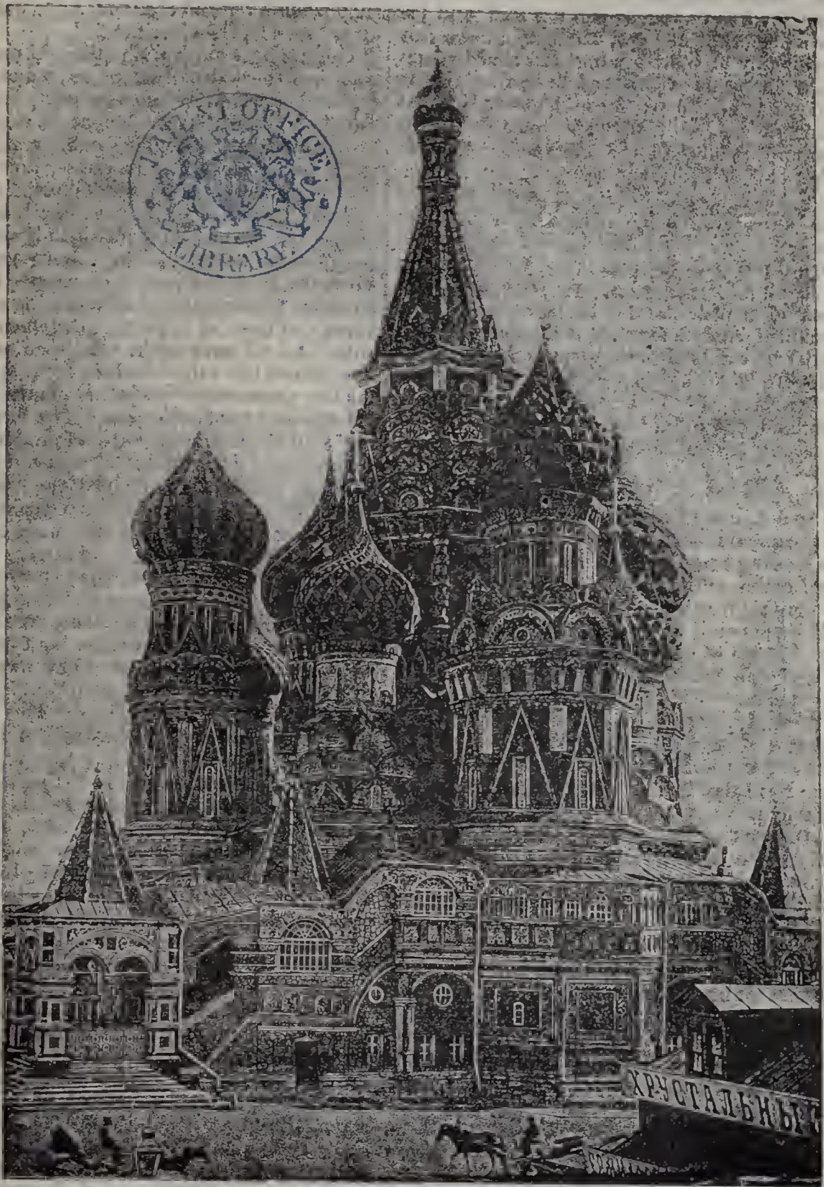
* To perform this analysis a few c. centimetres of the solution are measured off, and the oxalic acid then determined from measure by means of permanganate of potash ; the amount of iron in the same liquid may be ascertained in the same way, after reduction by means of zinc. But it is perhaps more convenient to determine by weight the iron in a separate portion of the solution ; this can be done by evaporating, heating to redness, incinerating with nitrate of ammonia, and weighing the ferric oxide which remains.

Whilst there I thought I would get a little hypo, in case I ran short on board; but I found it was one thing to want, and another thing to get that want supplied. I went to a chemist, and having tried English without avail, Latin was substituted, and here I thought I was understood; after an absence of ten minutes he returned with a four-ounce bottle with about an ounce of some orange-coloured substance. I hastily bid him adieu, feeling that it was perfectly hopeless. I had not gone many yards from the shop when I remembered that hypo was not the only fixing agent used on the Continent.

Passing over our quiet journey through the almost fresh waters of the Baltic Sea, we arrived at Cronstadt early on September 5th. Here one sees strong massive sea walls with numerals inscribed thereon at intervals, apparently impregnable forts, a double harbour, dry and other docks, immense barracks, custom-house, arsenal, and everything for the protection of St. Petersburg; and I am told much granite has been shot into the Neva, leaving open only the channel in the middle of it, which is about two hundred and thirty yards wide, but only ninety yards of the depth of three to four fathoms, the course being anything but straight, necessitating slow steaming on the part of large vessels. Most of these improvements have been made since the Crimean war. As soon as I went on deck I was somewhat astonished to see that the *Ceylon* had been taken possession of by a number of Custom House officials and their assistants. The former were in the captain's cabin examining and stamping the passports and comparing them with the list of passengers. While this was going on I critically examined the assistants, all of whom were clad in long drab military cloaks, seven league boots, a peculiar cap, and a fair thickness of dirt, the latter in preparation for the coming winter. This skin protector had evidently been a long time in progress, as there was a substantial thickness about it. The purser, an ideal picture of John Bull, told me there would be no objection to my taking my camera ashore, but that I must bring it back again and not sell it. The owner came to me ten minutes after, and in a solemn voice informed me that I should not be able to do so. This put a damper on my prospective journey. However, I did not give it up, so I picked out the least muddy one of the assistants, and luckily he spoke a few words of English. From him I learnt that which the purser had already told me. My thermometer, which had gone up to blood heat, but had rapidly gone down to zero, now resumed its normal condition. Our luggage was not examined, so soon after we were landed at Cronstadt to await the river steamer which plies to and fro between that place and St. Petersburg, a distance of 17 miles. The fare is 60 kopecks, about 1s. 1d., and they generally do it in about one and a-half hours. The last trip the *Ceylon* went all the way up to St. Petersburg, but with knocking a piece off the Nicolai Bridge, sinking a barge, and running on a sand bank, the owner had about enough of it, and declined to go this time. On reaching St. Petersburg we landed amidst a babel of droschkie drivers. This was somewhat of a startling scene to a stranger.

To tell a driver to take you to your chosen hotel is a very easy matter, but unless you can talk Russian and with a proper accent—a sort of expectorating cough and sneeze—you might as well talk to his horse. I have tried it on, and I know. However, we felt "landed" when we saw a 'bus with the hotel's name on in English characters. Reaching there in due course, four of us asked to be shown up to a room to wash our hands, for which operation we were charged 5 roubles (=9/7), and had to find our own soap. After dining we took train for Moscow, which is four hundred and one miles from St. Petersburg. In the saloon were several Germans, a Dutch couple, and an evil-eyed Russian, who quite haunted me, for no matter when I turned round, that man's eye was on me, until I began to think he must have a glass one. That I was an object of suspicion I had no doubt, for my luggage consisted of, besides a portmanteau, a camera bag and tripod. I was much relieved at early dawn to find he was no more. The country between St. Petersburg and Moscow can be summed up in a few words—flat, straight, trees, wooden huts, cabbage plots, haystacks, with an occasional stream of water. Reaching Moscow next morning about ten, we made our way to the Hotel Berlin, kept by a German named Clausen, who speaks very fair English, and was very kind and obliging during our short stay in that most wonderful city of churches, Moscow. As I try to confine myself as much to photography as possible, I have left out two-thirds of my journal, much of which I am sure would be interesting to many. My first shot here was at a Georgian Mosque, from the hotel balcony. I then took a droschkie, the proprietor of the hotel telling the driver the best route to go, and to stop at certain places for inspection. Passing the market, which was in full force, we came to that extraordinary church of St. Basil just outside the Kremlin Walls, with its eleven various coloured domes. Luckily there was a high bank, and under the wall I was able to take a satisfactory view, although the light might have been a little better. Coming down to change my slide a policeman came up, and I handed him a paper to read, whereon was stated that I was a harmless individual, and that I was only taking photos for my own pleasure. For I should say before leaving England, Mr. Warnerke kindly wrote it out in the Russian language, in order to save me much trouble. Whilst this man in authority was spelling it out, I was focussing the Bazaar and the circular erection placed over the spot where Ivan the Terrible butchered his victims. When he had finished, so had I, and his remark "probably" about a permit, fell flat, and I again got in my droschkie.



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CATHEDRAL OF ST. BASIL, MOSCOW.
Just outside the Kremlin Walls. Has eleven domes, each of a different colour.

(To be continued.)

PINHOLE PHOTOGRAPHY.

BY W. FORGAN.*

A good deal of interest has been taken of late in pinhole photography, considerable attention having been bestowed upon it in France, and afterwards among photographers in this country. There have been so many and varied opinions about it that, having myself tried it occasionally, I thought it would not be out of place to say a few words about it here, narrating my own experience. I daresay it is needless to explain what is meant by pinhole photography, but as I have met a few who have not only never seen a hinhole photograph, but do not know how they are produced, it may be well to say that pinhole photographs are taken by means of a minute hole in a metal plate without the aid of any lens. There is nothing new in this. It is just an example of another of those things which come to the surface now and again—new, perhaps, to a new generation, but well known to those of larger experience.

I think I have seen it stated that an aperture of one-eightieth of an inch is the smallest which can be used effectively with a lens. With a pinhole, however, the aperture may, I think, be much smaller.

The camera I used is a rough pine box firmly screwed together, with a hinged door at the back. It is large enough to take a 5 by 4 plate. The plate lies in a rebate, screwed on all round inside about half an inch from the door, and after the plate is put in I place upon it a piece of paper larger than the box and shut down the door, which is held close by two spring clips. The paper effectually prevents the access of light. The camera, as I originally made it, was 4½ inches in length from the pinhole to the plate, and thus gave upon a 5 by 4 plate an angular image of about 60°. I have, however, shortened the camera to three inches, which now gives me an angular picture of over 70°, and so includes more subject. The front of the camera has a hole bored in it by a one-inch centre bit, and over this hole is screwed a piece of thin zinc about 2 inches square. In the centre of this zinc plate I countersink by a small drill a portion of the zinc, and then by a gentle tap drive the point of a needle through the thin portion in the centre. A movable piece of zinc swinging on a pin in front acts as a shutter, which can be held in place over the whole by means of a small screw through its lower end.

It has been said that to get good pinhole photographs you must have very excellent apparatus. I have not found it so. You will see that no camera could be simpler or made in a more inexpensive way, and yet you may get good photographs by its means.

The pinhole which is in the zinc on the camera you now see is forty-eight one-hundredths of an inch in diameter—much larger than what I should recommend. I measured it only a few days ago, and thought it had been smaller; yet, with a hole of that size, very fair results can be obtained.

The good qualities of a pinhole camera are many :—

1. The first and chiefest of all is its cheapness. Anyone with the least ingenuity may make one for a few pence, and produce with it photographs at least equal to the production of many who use expensive apparatus.

2. There is no lens required, no stops to lose, and no glass about it to break, except the sensitive plate, which may be so well cushioned as to be also well-nigh unbreakable.

3. Another very important quality, and one which is of very great importance, is the fact that there is no distortion in the picture, every line being rendered as straight and true as in nature. The pinhole camera ought in this way to be of very great use to artists and others who wish to paint scenes which embrace architectural subjects. What can be so simple and easy as to place a pinhole camera in front of any building, and by a short exposure and a little trouble obtain a photograph in which every line of the building is rendered by the very best rectilinear lens ever conceived, perfectly straight and true and in true perspective?

4. Another good quality of the pinhole is, that there is no focussing required. Everything which the pinhole sees is in perfect focus—both near objects and distant ones. You may be standing beside a wall which will be rendered as sharp as the pinhole can, and so also will the spire of a distant church, or the sign of a shopkeeper a hundred yards away.

5. Any amount of subject may be got on the plate of a pinhole camera, according to the length of the camera, or the distance of the pinhole from the plate. It is not advisable, however, to shorten this distance too much for the size of plate used. I have mentioned that I used one giving an angle on the plate of about 60° This appears to be about the best limit, and gives the best results. If this angular aperture is exceeded, the difficulty is increased in getting the margin of the plate sufficiently lighted to develop evenly. You may see this very well exemplified by means of a ring or hoop. Those sitting directly in front can utilise the whole aperture, while those sitting towards the side fail to see the hoop as a circle, but more as an ellipse. Every plate, however thin we may make it, having a hole in it, acts much in the same way, and stops a considerable amount of the marginal rays.

The defects of a pinhole camera appear to be:

1. You cannot see the image on the screen, because there is no screen, and you are consequently left very much to guess what you have got. You must just level the box, guess at its contents, and fire away.

2. Another defect, but one which may not be of so much importance to some, is the want of sharpness in the resulting picture. Where the photo is wanted merely as a guide to paint a picture, this is of little consequence; but where a negative is wanted for enlarging purposes, pinhole photos are entirely unsuitable.

The first negative and print I show you was taken at 5 p.m., early last June, on a bright and clear afternoon. In the street where it was taken the schools had just been closed for the day, and there were hundreds of people on the street. The exposure was a minute and a half. You will see that there are no indications of any human being in the photograph; the street appears as if quite deserted; this result being obtained by the fact that the people were all in motion, and the normal state of the street is reproduced. You will also notice that the camera being placed near a plate-glass window, the street on the opposite side is reproduced from the reflection on the window, and so is the sign above the shop window. This photo renders all the stones in the pavement quite sharp, and every line is given in true perspective.

I also show you another of the same street looking north, taken at 10 a.m., a few days after the last. Exposure a minute; street crowded as before, but no indications of people on the photo.

A third negative is one exposed a few days ago at 11 a.m. Bright sunshine; exposure a minute and a half—far too much, as you will see.

These examples are all I propose to show you now. They will no doubt satisfy you that a pinhole camera is by no means to be despised. The examples we have hitherto seen have not been such as to encourage any one to take it up. I do not doubt that if I had used a very much smaller pinhole my results would have been much better; but even with the larger opening of 1·50th of an inch, the results I have shown you are such as to encourage many to try it.

THE PLATINOTYPE PROCESS.

BY FRED. W. COX.*

I do not purpose this evening detaining you with a history, interesting though it may be, of the experiments made by noted chemists over half a century ago—experiments which are, I suppose, considered to be the germs from which this process has resulted—but rather to endeavour to give an outline, at least, of the process, and my remarks will be addressed, therefore, more especially to those who are unacquainted with it. I propose at the close of my paper to illustrate some of my remarks by practical demonstration. The platinotype process was invented by Mr. William Willis, jun., and is the subject of three patents; but it is with the third and improved patent that I shall deal to-night. These patents are in the hands of the Platinotype Company, and a licence is necessary to work the process. I will pass round mine, so that you may see it is not a formidable document.

The ordinary paper supplied by the Platinotype Company is ready-coated or sensitised on one side with a mixture stated to consist of ferric oxalate and chloroplatinite of potassium, and this surface presents prior to exposure to affecting light a lemon-yellow colour. During exposure under a vigorous negative, the parts acted upon by light become a pale, greyish brown tint, and if the action be allowed to continue, the colour will gradually change to a dull orange. The ferric oxalate has been reduced to ferrous oxalate by the action of light, carbonic acid being set free. The print can now be developed by flotation, face downwards, upon a hot solution of potassic oxalate, which dissolves the ferrous image, the platinum salt is reduced, and a picture in metallic platinum black remains, a substance most durable, acted upon by aqua regia alone, and quite immutable by atmospheric influence. The print is then immersed in acid baths, followed by a wash in water. Such is an outline of this simple process. Practically speaking, daylight is necessary to print by. Printing has been conducted by othar means, such as electric light, at present out of the reach of the ordinary worker. The paper prints rapidly—it is said, three times as quickly as ordinary silver paper—and the rapidity in comparison with silver is more noticeable at this time of the year, when the light is less rich in the violet rays, which have a great effect upon the silver, and but little on the sensitive salts or platinotype paper.

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* A Communication to the Edinburgh Photographic Society.

* A Communication to the North London Photographic Society.

Development of the print should be done in subdued daylight, or by gas or lamp light, and numerous substances in solution can be used for the purpose. It has been pointed out that simple cold water will act upon the ferrous oxalate, of which the printed image is largely composed, and this will reduce slowly and partially the platinum salt; but I have not obtained good results by this method. What is wanted is a substance which will increase the action of the ferrous oxalate, and a hot solution of potassic oxalate has been recommended as the best for this purpose. The stock solution for the bath is made up as follows:—

Potassic oxalate	16 ounces
Hot water	54 ,,

The Company state that this solution must not have an acid reaction. I may say that, although I gave the neutral bath a fair trial, I found, as I believe others have done also, that by acidifying it with oxalic acid the results were more brilliant and satisfactory.

The normal temperature for the bath is 170° Fahr., although a higher temperature must be used for under-exposed prints and a lower one for those over-printed; indeed, in the case of a very considerable over-exposure, a cool, if not cold bath is, I think, a necessity, and the only way I know of obtaining a passable result. The higher the temperature of the developer the more rapid will be the action of the platinum and iron salts upon one another. In development upon a cool bath the chemical action is weakened, and before reaction takes place a part of the materials which would have helped to form the picture are dissolved into the developing bath, and a less vigorous, less rich print is the result. I would recommend a beginner in platinotype to fully expose, that is, have all details of the picture visibly printed out, and to develop upon a hot bath. The development in this case will be completed in a very few seconds. I am, however, aware that many experienced workers do not aim at such brilliancy as this will give, but prefer a cooler bath and different, perhaps softer, results. It really must rest with individual experience, judgment, and taste, to determine beforehand, from examination of a negative suitable for printing with the ready prepared paper, what style of print will suit subject best; exposure and development are regulated accordingly.

After development of a batch of prints, the solution is poured back into the stock bottle for use again and again; at the same time, I would point out that this solution must not be overworked. It is, therefore, advisable to keep up the bulk by adding fresh solution to make up for evaporation during developing operations. The bottle containing the stock solution should be either kept in the dark, or painted with Bates's varnish.

Immediately each of a batch of prints is developed, it is immersed in a bath of hydrochloric acid—one part acid, eighty parts water—for, say, ten minutes, then into a second bath of same strength for another ten minutes, and again into a third. The object of these baths is to remove from the paper all iron and other salts, and leave only the platinum forming the picture, and the operation must be thorough. It will generally be found that after the prints have been passed through these clearing solutions, that the first and second bath will show a yellow tinge, but the colour of the third bath remains unchanged. Should the third bath show any discolouration, a fourth must be used, and so on. The prints are now removed from the final acid bath and washed in changes of water for, say, twenty minutes to eliminate all acid from the paper; they are then dried, and can be mounted.

The question is often asked, "Are not very dense negatives required to give best results in platinotype?" My answer is, that the Company offers to the licencee the opportunity of purchasing from them the materials for sensitizing purposes, and that the relative proportions of the constituents can be so varied as to give a sensitized surface, to suit, I believe, almost any negative. I am told few workers in this country avail themselves of the offer, and it is not advisable for beginners, for obvious reasons, to sensitize for themselves, but rather to use the ready coated paper, which will be found to suit a sparkling negative, one not necessarily intense, but showing nicely graduated contrasts. The negatives I usually print from received full exposure and were developed slowly. It is said that negatives showing really fine gradation should yield prints exhibiting all the range of tone between a deep black and a clean white. At the same time, I would point out that good results are to be got from negatives of a different character.

The sensitized paper is said to keep in its best condition for a period of about two months; but it must not, therefore, be assumed that paper of greater age will not yield good results; in fact, it has been recommended that better prints are to be obtained on old paper, in cases where very dense or hard negatives with great contrasts have to be employed. My own experience corroborates this, working with paper at least six months old, cool developer used. I was lately shown some excellent results obtained by cold development on paper a year old, and recent experiments may lead one to hope that there is a possible future for old, and even light-fogged, paper. But there is at present an uncertainty regarding the behaviour of old paper, which renders its use undesirable.

Great attention must be paid to the fact that damp is fatal to platinotype paper. I refer not merely to the dampness which is apparent, but also to that which is present in the atmosphere during our driest weather. The precautions to be taken are these: The paper must be stored in suitable cases; the metal ones supplied by the Company are made with a perforated chamber at one end, containing chloride of calcium, for the purpose of absorbing moisture which may be present; and, further, the joints of the cases are protected by india-rubber bands to prevent the entrance of moist air. The chloride of calcium, on becoming damp, must be heated over a clear fire until the moisture is driven off, when it is again packed in the chamber. A sheet of india-rubber must be placed on the back of the paper before the printing frame is closed.

In damp weather, I always, prior to printing operations, dry my frames and warm my negatives before a fire. A damp print on development will give an image wanting in vigour, and generally foggy and unpleasant in appearance. I may mention that prints can be obtained of a sepia tone by using the Company's "Special Sepia Paper" and adding a special solution to the developer; also that various substances, such as wood, tiles, and textile fabrics, can be sensitised and printed upon. The more noticeable advantages of the process are—general simplicity of manipulation; the small quantity of apparatus and chemicals required for working; and the great sensitiveness of the paper as compared with silver. Moreover, undoubted permanence is claimed for the results.

The Company will supply full printed instructions for working the process, and containing the explanation of many minor details not mentioned by me; and I would recommend those who wish to dive deeper into the particulars of platinum printing to carefully peruse the interesting little work on Platinotype by Pizzighelli and Hubl, published by Harrison and Sons, Pall Mall. To the above-mentioned excellent publications I am indebted for much of the matter in my paper.

In conclusion, it is scarcely necessary for me to speak of the true charm and beauty of artistic prints in platinotype; this is already well known and appreciated. I cannot help thinking that a large number of photographers, frequenters of the various photographic exhibitions, within quite recent years especially—photographers whose partiality lay in the direction of the colour and glaze of a silver print—have gradually, perhaps sometimes unconsciously, yet surely, been educated in favour of tones, subdued—may I add more refined?—whether in platinum or photographic processes giving tones similar. Whether or not these are now to be counted in the increasing ranks of platinotype printers, I leave you to draw your inferences from the fact that many whose names at least, I venture to say, are familiar to all of us present on account of their artistic photographic achievements, are now exhibiting their choice works done in this process.

Notes.

Slowly, and with only a poor prospect of a thoroughly satisfactory result, does the Photographic Society struggle on with the revision of its rules; the fourth revision meeting of the members having come to an untimely end in consequence of the notice not having been posted to all.

The draft of the rules, as presented to the members by the Council, was itself the result of a prolonged contention between what we may call the Tory and Democratic sections in the Council: first one prevailed, then the other; and now the same matters are being fought out by the members at large. Our readers will remember that one of the old rules was a little indefinite as to the nominations for Council, and the necessity of making a verbal alteration here, was seized upon by both sides as a ground for a general and thorough revision of the rules, each party desiring to strengthen itself by the alteration.

The existing weakness of the Photographic Society appears to be that the body of members has not confidence in the Council, neither does the Council feel sure of the general body of members. At the same time the Council and the general body seem to be very similarly constituted, and one may expect the decision of one to virtually correspond with the decision of the other.

How can Council and members be brought into closer communion? is the main question for those who hope for a future of useful work by the Society. Possibly, by making the deliberations and work of the Council more open to the members. We know of an organization—and a far larger one than the Photographic Society—in which all meetings of the central Executive Council are open to the members, but non-Councillors may not vote. If, however, a non-Councillor expresses a desire to speak, a show of hands is at once taken as to whether he shall be heard: but when a question of very vital importance is under consideration, it is the usual thing for a resolution to be passed that any member may speak, and moreover, the Council often takes a show of hands for its own guidance. This system certainly works excellently, and it makes every member feel that he is individually responsible for the action of the Society. Moreover, business is got through with a promptitude which would astonish the executive of the Photographic Society; and what is perhaps more, the decisions are unanimous, except in rare cases. In short, there is no obstruction to business by an ever-present breastwork of distrust and misunderstanding.

A weekly paper remarks, that had not precautions been taken last Sunday to avoid a disturbance, "we should have seen the 'bus tops crowded with speculative photographers. Such a possibility was devoutly to be wished, so far as the previous Sunday was concerned. Judging from the conflicting evidence given at the hearing of almost every charge of assault, some such impartial witness as the camera was sadly needed.

If what a suburban photographer tells us is true, some of the "specials" will be sadly disappointed. On one of the foggy days of which we have had too many of late, a gentleman called at the studio of the photographer in question, and desired his portrait to be taken forthwith. The photographer demurred on account of the atrocious light. "Well," said the would-be sitter, "if you can't take my photograph I must go to some one who will. It is of no use asking me to come another day." "Of course I will try, but you must not expect anything very successful," replied the photographer, adding that he presumed the gentleman was going abroad. "Not at all!" was the answer; "you see, I was sworn in as a 'special,' and of course I expected that I should be allowed to keep the baton as a memento, as was the case over the Chartists' row in 1848. Between you and me—only you need not let it go further—that was the reason why I and half-a-dozen more went and offered ourselves. Well, I now hear that the police authorities will be mean enough to demand the return of the staff, and so I want a photograph of myself, just as I look on duty, to send to my friends in the country.' And producing an armlet from his pocket, and a staff from beneath his great coat, the 'special' solemnly arrayed and armed himself, and was taken in what he called "a firm, but not defiant, you know," position.

Verfluchte Dilettanten! exclaims the master of the orchestra, in the curious poetic whirl of ideas which occupies a place between the first part of Goethe's Faust, and the second part of the drama. And, indeed, this sentiment of cursing the amateur seems to be deeply seated almost everywhere but in photographic circles. The objection was especially noticeable last week and on Sunday last, in the behaviour of the professional policemen towards the specials; whom, indeed, these former chaffed, badgered, and befooled as much as they dared.

In the *Standard*, A. H. Webster, of 2, Redesdale Terrace, South Hampstead, writes of his woes as an amateur constable, he having, on Sunday, been battledored for instructions from King Street Police Station to Hampstead, and from Hampstead to Albany Street, and once more from Albany Street to King's Cross Road, after which he gave up all notion of getting instructions, so went home. Still the cruellest blow was the official intimation that an amateur constable could not arrest a real policeman, while the real constable may arrest the special.

A photographer took advantage of this sentiment on Sunday last in order to expose some plates in the contested square; but owing to the bad light and haze the results were very unsatisfactory. Presenting himself before the string of police which surrounded the square late in the afternoon, and carrying a small detective camera in his hand, he expressed a desire to go in to "take some of the queer ones with white rolling pins, and who cannot be trusted outside." He was allowed to go in and to expose his plates.

It is remarkable that we seem to have no English word to signify one who follows an occupation for the love of it, and are consequently compelled to use the French term ' amateur," or the synonymous Italian word " dilettante."

Harry Furniss, in last week's *Punch*, devotes half a page to illustrating the imaginary adventures of the Government photographer who has been told off, in accordance with the suggestion of a *Times* correspondent, for the purposes of detection, and for obtaining evidence at proclaimed meetings. This notion of employing the camera in Ireland was made in these columns in connection with the Glenbeigh evictions. This, however, is by the way; what we wish to point out is that Furniss, who is a practical photographer, ought to know better than make his operator, in one of his sketches, focus with the lens. Of course, it may be that he intends a sly stroke of satire, as a Conservative government would probably object to "improvements," and would insist upon its photographer using apparatus made a quarter of a century ago. We express no opinion on this point. It is, however, curious that in the central subject, representing the camera and the photographer, he has entirely omitted the instantaneous shutter. We do not desire to be hypercritical, and merely remark that if an artist who is also a photographer omits these little details, we must not be surprised if an artist who is not a photographer makes blunders when he has to deal with photographic apparatus.

A metallic camera, now advertised by a Parisian firm (Compagnie Francaise de Photographie, 7, Rue Solferino), seems—if we may judge by the sketch—to be the kind of thing that we have repeatedly suggested should be made. The advertisement states that it is made of nickled brass, with bellows to turn, and the 13 by 18 c.m. size (say 5¼ by 7¼) will draw out to 18 inches and close to 2¾ inches.

A passage in the recently published life of Darwin gives another blow to the science of physiognomy. When Darwin, as a young man, volunteered to go as naturalist on the voyage of the *Beagle* round the world, the commander, who was a disciple of Lavater, doubted whether any young man " with such a nose " could possess energy and determination for such a post. When such a mistake could be made in the inspection of the actual features, it is clear that our correspondent who, a week or two ago, pointed out the contradictory results of a physiognomical examination of a couple of photographs, was justified in his scepticism. As the *Daily News*, which commented on our correspondent's statement, said, " If it is all a question of exposure and top-lights, what becomes of the boasted science of physiognomy?" But after Darwin's experience we are inclined to go further, and say that without any difference arising from "exposure and top-lights," two physiognomists may, if consulted separately about the same photograph, be widely divergent.

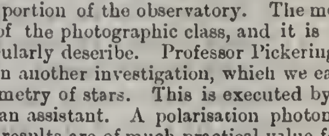
HARVARD OBSERVATORY AND THE HENRY DRAPER MEMORIAL.

The following is from the *Scientific American* :—

In 1875 Professor Henry Draper first succeeded in photographing the lines of the stellar spectrum. Having secured this triumph for America, he pursued his researches in the same direction until his death in 1882. His skill and ingenuity were alike remarkable. He was not one of those observers who, leaving details to others, try merely to do the final operations. He possessed the quality of thoroughness, and personally attended even to the mechanical details of his investigations. He ground his own specula. It is not too much to say that the work done by him derives a character of value and reliability from the attention to detail that only such an investigator could give it. His powers of handiwork, combined with his scientific standing, make him a model for astronomers. Had dry-plate photography been at his service, his work would have taken a far wider range. But using wet plates, that can only bear comparatively short exposures, he was at an immense disadvantage. One interesting feature of his labours was the scientific fellowship of his wife. It is said that he rarely went to his observatory without her. Hence it was with peculiar grace that Mrs. Draper became the founder of the Henry Draper Memorial. From funds of her providing, the expense of continuing Dr. Draper's sadly interrupted labours is sustained. No more fitting and useful memorial of the great scientist than this can be thought of. Besides this, Mrs. Draper continues to take a personal interest in the work as done. Apparatus formerly belonging to and constructed by Dr. Draper is soon to be added to the working appliances of the observatory by her liberality. Photographs of the spectra are sent her, and she maintains a vivid interest, because an intelligent one, in the results.

The different buildings containing the instruments and laboratories of the Harvard College observatory are situated in Cambridge, at quite a distance from the college whose name they bear. They are scattered over the crown of a grassy hill. On entering the grounds, the first building seen is the residence of the director, Professor Edward C. Pickering. Directly in the rear of this is the old Harvard College observatory, with its equatorial and its 15 in. telescope, a German instrument, in its day one of the great telescopes of the country, now relegated to the background by the triumphs of Alvan Clark and his sons. Back and to the side of these are what now constitute the principal working portion of the observatory. The most important work done is of the photographic class, and it is this division that we particularly describe. Professor Pickering, however, is also engaged on another investigation, which we can only allude to—the photometry of stars. This is executed by himself personally, with an assistant. A polarisation photometer is employed. The results are of much practical value for use in connection with astronomical work, and when completed are destined to form a most important standard of reference.

In a recent article on the Alvan Clark establishment, where the great telescopic objectives of the world have been ground, reference was made to photographic objectives. The photographic objectives used by the Harvard observatory owe their excellence to the Clarks. Such glasses have to be ground with a special view to focussing the actinic rays. A perfect photographic lens would be quite useless for visual work. In testing them, therefore, recourse is had to photography. Photographs are taken of a star, generally Polaris, or the pole star, on both sides of the chemical focus. If the lens is such as to bring all the actinic rays to a focus, the effect of photographing the star as described will be to produce a series of images, varying from a disc to a mere point, and then increasing in size again to a disc. The discs will be given by photographs out of focus, the point representing the focussed view. If the lens is perfectly ground, the lens will appear all as evenly illuminated images upon development of the plate. If the lens is out of adjustment, one portion of the disc will develop darker than the rest. We illustrate a series of representations of such test photographs, of the precise size of the originals. They were taken on the same plate of glass exactly as shown. One of the discs on the side showed a spot in the centre, indicating a faulty shape, which had to be remedied by the manual skill of the Clark brothers, from whom the plate shown was procured. The spectrum test is illustrated also. In this a spectrum of a bright



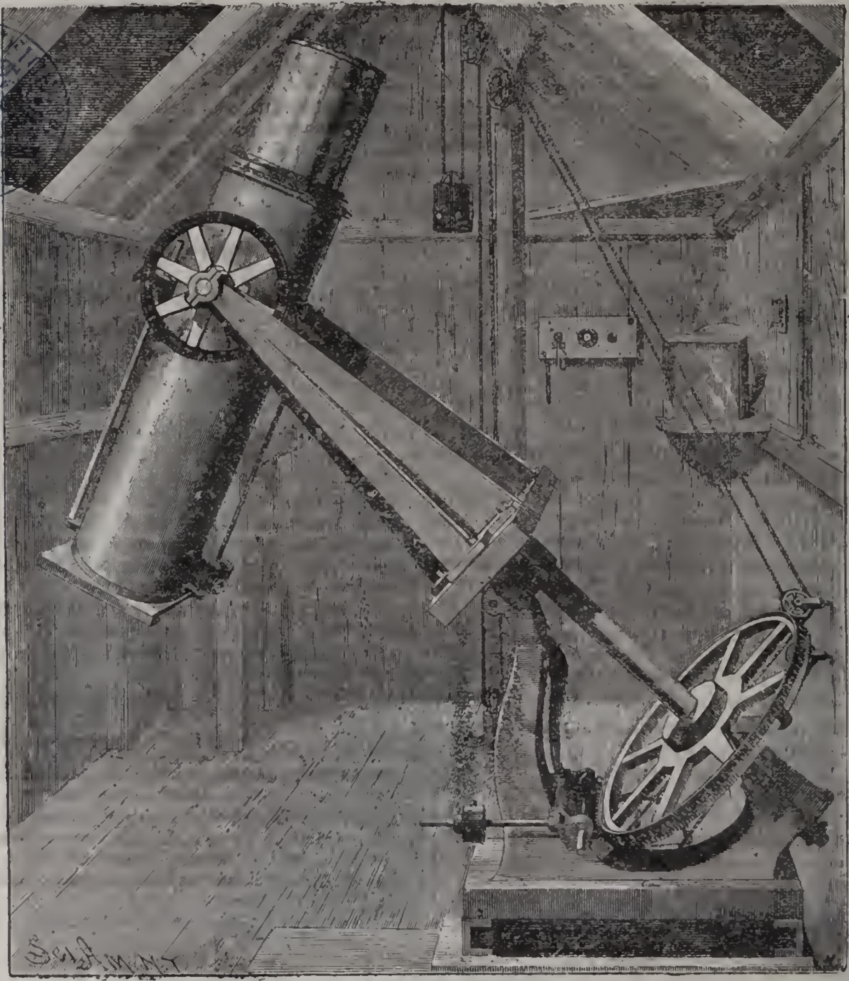
Photographic Tests of Objective.

spot is photographed of the size shown in the cut. Such portion of the rays as are brought to a focus will produce a spectrum of even width. If the more actinic portion acts thus the lens is proved correct. The spectra shown, also from the Clark Bros., taper to a point, the broad portion being out of focus. Hence the lens was out of adjustment. The interpretation of these results demands the highest order of skill in the maker of the lens, and it is not too much to say that the high quality of the Harvard observatory work could only be obtained through, and is due to, the unrivalled talent of the makers of the objectives.

The telescope shown in the illustration is contained in a small gable-roofed house. The instrument is erected on a very solid foundation, one which had been used in observing the transit of Mercury in 1878. Attached to its base is a circular level of exceedingly great delicacy, by which it can, when necessary, be adjusted. The building in which it stands is rather peculiar. The gable roof is in two sections, being divided across its centre, and is mounted on wheels running on tracks parallel to the ridge. When the instrument is in use, these two segments are pulled apart, to the entire length, if desired, of the building, the rails in prolongation of the plate beams being carried outside on each end of the house, a distance equal to one-half its length. The mounting of the telescope is also peculiar. A steel tube is carried by trunnions in the end of a large fork. Into this tube the brass tube containing the lenses is screwed. The polar axis is in prolongation of this fork. Hence, if the glass is directed to a given star, and rotated on the axis with sidereal time, the star will occupy the same position in the field of view. As a simplification of the usual methods of mounting the plan is of interest. The telescope is carried symmetrically, so that no counterweights are needed. This saves weight. With it any star can be followed uninterruptedly from rising to setting. Polar stars are as easily kept in the field as any others. It does not seem well adapted for visual work, as the fork mounting would interfere with the observer in the case of polar stars.

(*To be continued.*)

PATENT OF
LIBRAR



Eight-Inch Photographic Telescope.

HINTS ON LANTERN WORK.

BY W. JEROME HARRISON, F.G.S.

Although the magic lantern has now been known for more than three centuries, its extended use as a means of public instruction scarcely goes back more than a tithe of that period.

The *oil* lantern will give a sufficiently good light for pictures not more than four feet in diameter. The quality of the light may be improved by dissolving a little camphor in the oil, the reason being that camphor is rich in carbon, and it is to glowing particles of carbon that the oil light owes its brilliancy. Objections to oil are the smell and the heat. The former may be obviated by using great care in not allowing a drop of oil to fall on the outside of the metal-work (almost impossible to help this in practice, though); and the heat may be somewhat mitigated by a wood casing to the metal body of the lantern. The wicks require very careful trimming and adjustment. For my lectures to classes of from thirty to fifty in number, I use a Sciopticon (two-wick), and a three-wick lantern by Place, of Birmingham. Each of these performs as well as it is possible for an oil lantern to perform; their advantages are: (1) they are light, compact, easy to carry about, (2) and they can be set up ready for work in five minutes.

The electric light is hardly yet within the practical range of lantern work. The expense is prohibitive in most cases, but there are special cases where it might be of great value. Thus in 1885 I submitted a scheme to the council of the Colonial Exhibition for a lantern display upon a sixty-foot disc, which would have necessitated the use of the electric light to give sufficient brilliancy of illumination.

For general work there is nothing to equal the oxyhydrogen light, the "hydrogen" being replaced by ordinary coal-gas without the least disadvantage. Nothing can be simpler than the preparation of the oxygen. My present formula is:

Chlorate of potash...	1 pound
Black oxide of manganese ...	5 ounces
Common salt	3 „

The salt has a wonderful influence in steadying the evolution of the gas. The above quantity will make nearly four cubic feet of oxygen gas.

All commercial oxide of manganese contains, as an impurity, a little chlorine, which, if allowed to enter the gas-bags, will attack and destroy the material of which they are made; therefore wash the oxygen by passing it through two-necked bottles containing water in which a little carbonate of potash has been dissolved.

Use the "mixed jet"; you will get double the light, and, with ordinary care, there is no danger. For this light a hard lime (the "Excelsior" limes are the best) is necessary. It must be revolved every few minutes, which is best done by hand from the back of the lantern by a very simple contrivance affixed to the jet by Place.

Triple, and even bi-unial, lanterns are very good—*for the makers.* A single lantern will answer every ordinary requirement; it is half the size, and half the weight. But looks go for a good deal, and the professional exhibitor doubtless finds that it "pays" to carry about his glittering pile of brass and polished mahogany.

It is economy to have the gas-bags of the best make. Each should have a "lock-tap," and, with the key of this in his pocket, the exhibitor feels more comfortable. The best weights are iron "sash-weights" of about 30 lbs. each; but when these are not at hand, "fifty-sixes" make a good substitute. I invariably commence with a weight of 112 lbs. on each bag, and add a third "56," and even a fourth as time passes, and the bags become nearly empty. Each gas-bag should have plainly painted upon it on both sides (in zinc-white) the initial letter of the gas it is to contain—O for oxygen, and H for hydrogen or coal-gas. The pressure-boards should be marked in the same way; let the letters be six or eight inches high, and their lines an inch wide. Numerous accidents, caused by putting gases in the wrong bags, would have been prevented if this plan had been adhered to.

For ordinary lecture-rooms, such as will accommodate 800 or 1,000 people, a twelve-foot disc is quite big enough. It is always much better to have a small picture brilliantly lighted, than a large and dim one.

Place's double slide-carrier, which takes any size slide, is self-centering, and, withal inexpensive, is an excellent form. It was used at the Derby Convention with great success. The moving of the pictures on the screen when changing (which disagreeably affects most eyes) can be obviated by passing a piece of ground glass in front of the lens at the moment of shifting the carrier. "Dissolving" views have gone quite out of fashion. They involve a dreary wait between each picture, and limit the number which can be shown.

In conclusion, we think that every photographer ought both to make lantern slides and use the lantern to exhibit them. In gazing upon the picture produced by a first-class lantern, with slides made from landscape negatives of like quality, it is quite possible to imagine that we are viewing the original scene—a result which is surely worth working for.

Review.

Marion's Practical Guide to Photography. Crown octavo. 230 pages, cloth. Price 2s. 6d. (*London: Marion & Co., 22 and 23, Soho Square, London, W.*)

The present edition of "Marion's Guide to Photography" is well brought up to date, is attractive in appearance, and is well adapted for placing on the shelf as a handy reference book.

Patent Intelligence.

Applications for Letters Patent.

15,722. Henry Sutton, 28, Southampton Buildings, Chancery Lane, London, W.C., for "An improved process of converting a photographic image on a gelatine surface into a relief or intaglio printing surface."—Complete specification.—16th November, 1887.

15,727. Ernest Howard Farmer and Harry Kneebone Tompkins, 45, Southampton Buildings, London, for "Improvements relating to the preparation and use of materials for photographic purposes."—16th November, 1887.

15,827. William Edwin Moss and John Mitton, Alfreton Road Nottingham, for "An improved method of heating hollow rollers for photographic rolling presses, rolling machines, and the like."—18th November, 1887.

15,984. William James Cox, 17 and 18, Southampton Buildings, W.C., for "An improved method of, and apparatus for, coating glass or other surfaces for photographic purposes."—21st November, 1887.

16,003. William Willis, 45, Southampton Buildings, London for "Improvements relating to photo-chemical printing."—Complete specification.—21st November, 1887.

Official Abstracts of Accepted Complete Specifications.

Raymond, 1079, 1887. "Printing surfaces." Photographic [or in preparation of which photographic means are used], of gelatine, with addition of alum and borax, spread on parchment paper, &c., and exposed in close contact with negative.

Correspondence.

THE PHOTOGRAPHERS' BENEVOLENT ASSOCIATION.

Sir,—No doubt ere this many of your readers have, like myself, been favourably impressed with the circumstance which led to an impromptu collection being made at the North London Photographic Society's dinner, on the 14th inst., on behalf of the fund of the Photographers' Benevolent Association, and would gladly welcome it as a custom at all Photographic Society dinners.

All who attend these annual re-unions must have noticed the hearty good fellowship pervading the company on such occasions, and it is certain that it only required the example now set—namely, that of showing a little kindly sympathy with the objects of the Benevolent Association—to ensure its universal adoption.—Yours faithfully, W. M. Ashman.

THE PLATINOTYPE PROCESS.

Dear Sir,—Captain Pizzighelli's new Platinotype process, as detailed by Mr. Gunther in your last issue, seems to be a decided advance on the original process, and no doubt very many of your readers, myself amongst the rest, will be seized by a desire to give it a trial. Unfortunately, however, Mr. Gunther has rendered this impracticable by omitting to give, in his otherwise explicit article, the formula for the "normal ferric-oxalate solution." Can you not induce Mr. Gunther to communicate directions for making up this solution, or, failing this, to state name and address of publishers, and price of Pizzighelli and Hubl's work (Italian and French editions) containing the requisite information?

I presume the new process in no way infringes the Willis Patent rights, and that any photographer can prepare and work the paper without the imposition of licence or other conditions of the Platinotype Co.?—I remain, yours faithfully, C. C. Vevers.

[The particulars asked for will be found on p. 739.]

PROFESSIONALS AND AMATEURS.

Sir,—I have lately read a complaint of professional photographers in which it is said many amateurs take portraits and sell them at a price which, while it covers their expenses, is so low as to damage the professional man. I will not say this is reprehensible, but I do say it is regretable. It is well known to most people that photography as a business is terribly cut up. The competition of the many who are in it leads to this, and good work can be got on terms that to make it pay seem to necessitate full employment for an establishment that has to employ expensive assistants. If this is the case with higher class work, it is still more so with that which is intermediate and lower. Competition, then, with the so-called amateur is to be deplored, for it creates an evil, not only by robbing the tradesman of his customer, but by giving an impression that photography, like the doctor's draught, is all profit. I, as an amateur who have not to retain retouchers, who may, or who may not be employed all their time; who have not to pay printers and a manager, extremely high rents, and fifty other expenses I know nothing of, can tell all men it is not so. I can tell them the money at present paid for portraiture is well and honestly and ofttimes hardly earned.

The idea that photography costs but a trifle to the producer lies, I feel sure, at the doors of many amateurs, and it is much to be regretted. If to this be added the injury complained of, of competitive prices, there must be some who should cease calling themselves amateurs.

An amateur who is a gentleman will benefit, and not injure, the professional trader. By not giving prints away, but by referring his friends to a professional, to whom he will lend his negatives to print from and supply to them at a reasonable price, this can easily be done. That it is practicable I have proved by doing it for years, and have thus benefitted the owner of a small business in this town.

I am considering a project which I design should benefit the professional and others also. I am preparing a shaded nook for a horse studio, and propose to take horses, and where desired, their riders, direct on 20 by 16 plates. For this, and one copy, a charge of two guineas will be made. Of this sum I intend one guinea shall go to the professional who will furnish plate, paper, and printing; the other will be given to those poor persons who are not reached by benevolent societies, and the medical men of this town will be asked to be its almoners.—Yours obediently.

Melton Mowbray. William Adcock.

ORTHOCHROMATIC PHOTOGRAPHY.

Dear Sir,—In Mr. Bothamley's concluding article, which appears in the News of the 11th inst., reference is made to Messrs. Attout, Tailfer, and Clayton's patent for "Application of Eosine to the Gelatine Bromide Process."

We have no intention of discussing the validity of the patent; this is a matter which will be decided in the law courts if necessary. We must, however, beg leave to take exception to Mr. Bothamley's remarks as to the alleged want of clear and definite instructions for carrying out the invention described in the specification, the wording of which Mr. Bothamley seems to have curiously misread or misinterpreted.

As a matter of fact, the invention is described in the English specification so fully and clearly, that any one having a competent knowledge of the subject can work it without difficulty. The correct proportions by weight between the silver bromide and the eosine are given, and we may state that in our manufacture of isochromatic plates on a large scale the process is worked exactly as described by the inventor.

The failure of Mr. Bedford and others to work the process at first trial was, in all probability, owing to the use of an unsuitable sample of eosine, many preparations of which, sold under various names, are totally unfit for the purpose. We have Mr. Bedford's own authority for stating that upon further treatment with a different sample of eosine he succeeded at once in obtaining good results.

With regard to the quantity or proportion of eosine in the colour-sensitizing solution in Tailfer's bath process, it is quite correct, as stated by Mr. Bothamley, that a one per cent. solution is far too strong for the purpose. No such proportion is, however, mentioned in Tailfer's specification, and would certainly not be used by anyone having the most elementary knowledge of the subject.

We have carefully read the detailed accounts (which have appeared from time to time in the News) of Mr. Bothamley's somewhat extended series of experiments, and we regret to find that neither of the two processes given in Tailfer's specification have been tested or reported upon in any way.

Mr. Bothamley appears to have confined himself exclusively to various specifications of more recent date, chiefly of German origin. None of these latter processes are calculated to produce perfect orthochromatic results; the best of them are only imitations of Tailfer's original process so far as they include the use of eosine, or its derivatives, with ammonia, other important parts of the process being in every instance left out altogether. For these reasons it seems to us that Mr. Bothamley's paper, as it now stands, is singularly incomplete. We have no hesitation in saying that if he had tried any of the original processes (patented by Tailfer and Clayton) he would have produced (especially when working without the yellow screen) very different and far more satisfactory results than those he has now described.

Should Mr. Bothamley at any future time care to resume his experiments, we shall be happy to render him every assistance in our power, and supply emulsion, plates, and material for the purpose of comparative experiment.—We are, dear Sir, yours truly, B. J. Edwards and Co.

The Grove, Hackney, London.

Proceedings of Societies.

Photographic Society of Great Britain.

A technical meeting was held in the small room attached to the Gallery, 5a, Pall Mall East, W. England, Vice-president, in the chair.

Colonel Noverre gave some interesting particulars as to his work with the Eastman stripping film, and mentioned that in some instances he had found that the negative image extended into the soluble layer of gelatine, especially when pyro and ammonia developer was used.

Photographing on wood, the claims of the Cellerier Syndicate, and other subjects were then discussed.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 17th inst., at Mason's Hall Tavern, Coleman Street, E.C., W. M. Ashman in the chair.

The Hon. Sec. drew attention to prospectuses sent by the

Liverpool Amateur Photographic Association, anent that Society's Exhibition to be opened in Liverpool on March 5th, 1888, particulars of which can be had of T. S. Mayne, Hon. Sec., Fenwick Court, Liverpool.

F. H. Berry, R. W. Goodden, and W. B. Wright were elected members of the Society.

F. W. Cox, for the purpose of heating platinotype solutions, used a solid flame, Fletcher's gas burner; it was the cheap pattern, and convenient to rest the trays upon. An example was shown.

A. Haddon remarked that a direct flame was liable to crack the enamel glaze of the trays sent out by the Platinotype Company. Enamelled iron trays acted well enough when used on a water bath.

F. A. Bridge had not experienced any difficulty in this respect. Some of his trays had been in use four or five years. Direct heat had been applied, and there was no vestige of a crack in the enamel.

A. Mackie pointed out that some enamelled iron vessels proved better than others; culinary utensils of this kind, he said, were placed in contact with the flame. The discussion was continued for some time.

The Hon. Sec., W. H. Prestwich, the Chairman, and others, related their experiences, the outcome of which appeared to be that cracks were likely to occur when a thick coating of enamel had been given.

A. P. Higgins showed a contrivance he had made for filtering emulsion. It consisted of the top half of a Winchester bottle corked, through which the stem of a glass funnel passed. Hot water has to be poured into the jacket, which prevents the unfiltered emulsion setting.

Cutting bottles was next discussed.

The Chairman secured a piece of string, soaked in turps, round the part to be divided. This was lighted, and the bottle put into water, when it usually cracked along the line of string.

W. H. Prestwich adopted that method extensively for cutting hock bottles, and rarely failed; when he did it was due to the metal being thicker on one side than the other.

A. Cowan said that Mr. Warnerke filed a mark round the bottle, and followed this with hot charcoal.

A. Haddon, in company with Mr. Wilson, had to divide about thirty glass tubes, and they found the best plan was to cut the glass with a diamond from the inside, and heat the outside with a Bunsen burner.

W. H. Harrison said bottles could be successfully divided by placing them in a vessel of water to the depth of the dividing line, then put a thin layer of turpentine round this part and set fire to it.

The Chairman observed that glass of any ordinary thickness in studio or other windows could be cut quite easily by using a diamond on the inside; but it was not so certain to cut from the outside.

F. A. Bridge had also notified this fact.

The Chairman drew attention to a photograph of the human eye, sent by Robert Offord. He (the Chairman) thought it a direction in which photographers might render great assistance to painters.

This led to a discussion upon the difficulty of describing the exact colour of the eye, and the general opinion was that in this example expression was not due to the photograph of the eye, so much as to the surrounding portion of the face shown.

An interior, also sent by Mr. Offord, taken by means of magnesium ribbon, was next passed round.

W. H. Harrison said magnesium ribbon could now be bought at 1s. 10d. per ounce.

The Chairman objected to burning magnesium ribbon or powder in an open room, for it was difficult to get rid of the smoke produced. A friend of his, he said, had contrived an arrangement for burning magnesium in oxygen, whereby the smoke nuisance was avoided. No doubt it would come before the Society in the form of a paper very soon.

W. H. Harrison said Herr Gadicke had devised a lamp to burn magnesium without smoke. He used a flashing powder.

A. Mackie referred to some recent experiments at the Photographic Club, in which magnesium and gun-cotton in varying proportions were burnt. This matter has already been referred to in the News.

E. Clifton said the addition of gun-cotton increased luminosity.

The Chairman: Burning magnesium in a cylinder of oxygen does this also.

The discussion was continued by F. A. Bridge, W. Cobb, P. Everett, W. E. Debenham, A. Haddon, and A. Mackie.

What is the most prolific cause of white spots in silver prints? was a question discussed.

C. H. Cook: Carelessness.

W. E. Debenham said one source of light spots in prints came from particles of lime becoming detached from the wall and falling upon the prints while washing. These might not be larger than a pin's head. In one instance he knew of, spots had been traced to this cause, and upon moving the disintegrated surface from the wall, the evil ceased.

The Chairman instanced another case where spots had been caused by fine particles falling from the ceiling upon the prints. The toning and fixing was carried on over the room used for mounting.

F. A. Bridge had an idea that some enamelled mounts were more prone to cause spots than others.

W. Cobb believed bronze powder to be responsible for a large number of spots in silver prints, and the danger of printing with bronze powder in the same apartment where mounts were otherwise printed was said to be a risky proceeding.

The Hon. Sec. said that bronze powder was the most difficult thing to get rid of when once it became attached to a mount. After some further discussion,

On the 1st prox. a paper will be read by F. A. Bridge on "One of the Causes of Spots and Fading in Mounted Silver Prints."

North London Photographic Society.

At a meeting held at Myddelton Hall on the 15th inst., Mr. Hiscock in the chair, R. S. Allan was elected an honorary member of the Society.

A large number of views of Lisbon and neighbourhood were passed round by A. P. Higgins, and a selection taken in Holland by A. C. Cossar followed.

E. W. Parfitt showed two negatives taken under similar conditions; he desired to know why the difference in quality.

A. Pringle thought one had been slightly fogged.

F. W. Cox then read a paper on the "Platinotype Process" (see page 742), and developed several exposed prints.

J. Traill Taylor testified to the permanency of platinotype prints, and referred to some which had been subjected to extremes of temperature for some years, and were now as good as when first made. Other prints made in silver at the same time had faded very much.

W. Cobb confirmed the President's remarks as to permanence, and mentioned that he took the first medal given for this class of print.

Mr. Pringle said his name had been mentioned in connection with the question of the permanence of these prints, and he should like to correct a misunderstanding. He had put platinotype prints to a series of tests quite satisfactory to the Company, but found by treating them with sulphuretted hydrogen he could materially reduce the image, but under ordinary conditions he believed them to be absolutely permanent.

A. Cowan spoke of a difficulty in matching panoramic views by this process. On one occasion, when he desired to match a picture four feet long from four negatives, it was necessary to produce eighty-four prints in order to get twenty-four alike in tone.

W. M. Ashman alluded to the difficulty of printing-in skies from separate negatives, and congratulated the lecturer upon the results shown.

The next meeting will take place on December 6, when T. Charters White will lecture on "Photo-micrography." Visitors are invited.

Camera Club.

At the lantern evening (November 17th) there was an unusually excellent and varied show of slides. Amongst the exhibitors were C. B. Wright, P. Newman, Fison, F. Evans, Frith, Stainthorpe, Davison, Barclay, and Lionel Cowen.

The first part of the evening was devoted to pictures taken in Norway, by C. B. Wright and Fison, and to Swiss scenery, by P. Newman. Mr. Fison's series included some interesting slides, showing scenes in Norwegian villages, and those of Messrs. Wright and Newman comprised most beautiful and artistic effects of clouds and atmosphere amongst the mountains and lakes of Norway and Switzerland respectively.

After an interval Mr. Evans showed a very fine set of transparencies of cathedral interiors, also country studies ; Mr. Frith a set from negatives taken in Egypt, and Mr. Barclay several illustrating work done on club excursions. The lantern was worked by Lyonel Clark and E. Ferrero.

The subject for December 1st is "Photography as applied to the Arts and Sciences," when T. C. Hepworth will lecture and show illustrations, Meeting at 8 p.m.

Photographers' Benevolent Association.

The Committee met on 17th inst., when the election of Messrs. J. N. Dewey, J. S. Grimshaw, W. C. Smith, and J. Joel was confirmed.

The Committee then considered an application for aid to enable a member to proceed to a situation. The sum of £2 was granted.

The following letter was received under date of 11th inst :—"Dear Sir,—I am directed to hand you enclosed cheque, value £32 5s., being the net amount received as entrance fees from ladies and gentlemen (258 in number) who have contributed their productions to our Third Annual International Amateur Photographic Exhibition, 1887. When the pictures are exhibited at our Regent Street Gallery, we entertain the hope that the contributions we shall invite from visitors may form an important addition to our present donation.—I am, dear sir, yours faithfully, S. Clark, secretary, London Stereoscopic and Photographic Company, Limited." The Committee passed unanimously the following :—"That the Committee of the Photographers' Benevolent Association tender their best thanks to the managers of the London Stereoscopic Company for handing to the Benevolent Association the entrance fees of the contributors to their exhibition."

A letter was then read from the North London Photographic Society as follows :—"Dear Sir,—I have much pleasure in handing you cheque for £1 4s., being the proceeds of an impromptu collection at our dinner last night.—H. M. Smith, hon. sec."

A member of the Committee then stated he was authorised to hand over the sum of twenty guineas to the Association on the condition that £500 should be obtained within twelve months for the express purpose of forming the nucleus to an orphanage. This generous offer was received with enthusiasm, the Committee pledging themselves to use their utmost endeavours to fulfil requirements of the condition.

The amount was then handed over in trust, and the meeting terminated.

Cheltenham Photographic Society.

Annual general meeting held November 10th, at 4, Clarence Street. The formal business consisted of the election of officers, which resulted in the return of last year's officers to their posts. Certain variations in the Rules having been agreed to, the meeting proceeded to examine an exhibit of apparatus sent by Mr. McKellen.

General **Dawson** produced and explained McKellen's camera with all the recent additions, including the new back which enables the operator to dispense with the focussing cloth.

Mr. **Bertram** showed the working of the roller slide of the same maker. This differs in some respects from the Eastman slide, having a means of washing the paper between each two pictures, and also in automatically recording the number of exposures made.

Sargeant's shutter was also on view, notable for its small size and easy working.

General **Dawson** introduced the subject of stripping films, showing his own negative and prints, and calling attention to the different effect produced according as one or the other side of the gelatine skin is placed in contact with the negative ; in one case producing a clear negative, in the other a ground glass effect, very suitable for weak negatives.

It was arranged that at the next meeting Mr. Bertram should demonstrate the process of developing and stripping these films.

Edinburgh Photographic Society.

The following is an abstract of the annual report presented at the meeting on Nov. 2nd, noticed in our columns last week :

In presenting the twenty-eighth annual Report, the Council are again pleased to have it in their power to congratulate the members upon the good progress which the Society continues to make. During the session forty-nine new members have been elected, and after making the deductions which a year's vicissitudes bring, in removals, resignations, and deaths, the total presently stands at 425, as against 393 last year. In one instance death deprived the Society of one who has been almost from its beginning a prominent figure in its history. J. G. Tunny died on 24th September, after a protracted and painful illness. He ever took an active interest in the welfare of the Society, and was repeatedly an office-bearer. Nine ordinary and thirteen Council meetings have been held, and besides numerous subcommittee meetings. A number of outdoor excursions took place, which, though not numerously attended, were much enjoyed by those who took part in them. Two popular evenings were given in Queen Street Hall, which was crowded on each occasion. On both evenings vocal and instrumental music was provided by members and friends. The annual exhibition of members' work took place in December, and was considered a very creditable one. About 260 pictures were shown in prints, ceramics, and transparencies. The presentation print for the session was issued in August, from a negative by H. P. Robinson. The subject is entitled "A Chat with the Miller." It is executed in collotype, and has been much approved. An interesting feature of the year was the visit to Edinburgh, on 8th July, of a large excursion party from the "Photographic Convention of the United Kingdom," then meeting at Glasgow. The report alluded to the papers and communications, demonstrations of film stripping, and apparatus exhibited, all of which have been duly chronicled in these columns.

Cardiff Amateur Photographic Society.

The second annual dinner took place at the Angel Hotel on the 17th inst, about forty gentlemen participating. **Alexander Kellar** presided.

The company included Mr. Parker Hagerty, Capt. Shor, R.A., Mr. Edwin Seward, R.C.A., and Mr. H. J. Giffard.

After the customary loyal and other toasts, that of "Our late President" was given.

In responding to this Mr. **Allen** said : That being chosen first President of the Cardiff Society was, to him, a source of great pleasure and pride, knowing, as he did, the very important part played by photography in all matters of modern science. Speaking as an engineer, he felt that the art was one that no engineering establishment of any importance could afford to ignore, and that most large firms now felt this so much that they are obliged to add a photographic department to their business, in order to secure accurate delineations of their manufactures, as well as to duplicate their drawings and plans, the latter being generally done by the ferro-prussiate process. No matter how complicated the drawing or tracing might be, the photographic copies might be multiplied to any extent and in the merest fraction of time, thus rendering it easy to duplicate working drawings in a manner that was utterly impossible before adopting this invention. Photo-printing processes were now superseding lithographic drawing and wood engraving to a very large extent, and scarcely an illustrated journal now goes to press without blocks thus produced being employed. We are thus enabled to see in print copies of original drawings direct from the hand of the artist, a matter of immense importance from an artist's point of view, and of no less importance when looked upon with an eye to its scientific usefulness ; as by its means we can obtain correct data of progress of works, such as that immense triumph of modern engineering skill, the bridge now building over the Firth of Forth, so splendidly illustrated in the pages of *Engineering* recently, wherein the whole of the plates were executed by means of photography in such a way that for accuracy and artistic effect, could not be equalled by any other art. Photo-lithography is now the only process employed in the large illustrations of the architectural papers ; whilst the various forms of photogravure are so well known to most of you that you cannot fail to appreciate the splendid copies now to be obtained of original paintings taken direct by photography and translated into monochrome, and sold at a comparatively small cost, and as works of art can well hold their own with the best line engravings. He felt that the art of photography was much misunderstood by the general public, the majority of whom are satisfied with the most crude productions, and look upon it with a very indifferent eye ; some artists even imagine that it is capable of doing much more than it is really capable of. For

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instance, photographers are blamed for their want of art knowledge when a landscape photograph is being criticised, because the values are not correct and the tender greys of the distant hills are completely lost, and the foreground and middle distance are a mass of black. Now it is here where chemistry plays such an important part in the production of a picture, and scientific development should go hand-in-hand with our knowledge to produce a pleasing result.

Vice-President Dyer then gave "The Scientific, Artistic, and Literary Institutions of the Town," which was responded to by Mr. Seward, who, in the course of his remarks, said it was appropriate to bear in mind that that toast was first proposed in a public manner in Cardiff, at the first dinner of the Photographic Society last year, and it was worth remarking that at the municipal banquet just past, the same toast took an important place on the list. Not only in that respect had the Corporation of Cardiff had an eye in the direction of their Society, but on the previous day an influential Corporation Committee, with Sir Morgan Morgan at its head, had been placed in charge of the scheme for a National Institution for Wales, which was also first publicly mentioned at the Photographic Society's dinner before referred to, and with which their Society and several others were affiliated. It was true that during the discussion of that scheme hitherto, reasons had been found on the part of some of the Societies at first associated to turn in other directions for the promotion of their own objects, but those objects were in some cases very special, and as had been shown, could not be satisfactorily associated with the project for developing the aims of scientific commerce, of art, and of literature, for the benefit of Wales through those societies now existing at Cardiff, as the chief town of the Principality. It was a subject for congratulation to them all that this important project had the direct co-operation of the Corporation, and whatever might be the final outcome of the deliberations of the committee of the Corporation and the various societies' delegates, they could depend upon the fact that the claims of art would be steadfastly upheld in Cardiff in an effective manner.

The next toast was "Kindred Photographic Societies," coupled with the name of H. J. Gifford, who, in replying, stated that he was glad to hear that the Cardiff Society proposed affiliating themselves to the Camera Club. He also thanked them for the cordial way in which his health had been drunk. The Societies in London sprang from the Photographic Society of Great Britain, which could rank with the Royal and Chemical Societies, but for amateurs he thought the less formal societies or clubs were preferable.

Parker Hagerty, in replying to the toast of "The Visitors," expressed the pleasure he derived from the opportunity of being present that evening. When he accepted the invitation he had no idea that he should meet so many gentlemen interested in the delightful art of photography. He admitted that several of his brother artists did not put that value upon photography as an aid to their own art that the science was entitled to. Speaking for himself, however, he must acknowledge he appreciated its worth from practical experience.

Queensland Photographic Society.

At the second annual conversazione given by the members of this Society, when the hall was well filled with members, their friends, and invited guests, the conversazione took the shape of an exhibition of work done by members of the Society, and numbered in all about 300 photos., tastefully arranged for inspection. Taken as a whole the work was of a very clear, superior quality for amateurs, the views being admitted to be in photography equal to anything which has been shown in Brisbane.

J. W. Sutton, who is an enthusiast in photography, showed a large number of exhibits. Some views taken at the last regatta held at Breakfast Creek, done in iron, were very good, the blue tint of the iron being specially suitable for marine views. These photographs were more like drawings coloured than photographs. Some others by a different process, being photographs of Landseer's pictures, looked more like engravings than photographs, the lines were so sharply and clearly defined. There were also some very fine autotypes, to be given away during the present season as prizes to successful competitors.

T. R. Hall opened the show, and stated that the Society had been three years in existence, and had now a membership of over 60, all active enthusiastic members.

Talk in the Studio.

Forthcoming Exhibition at Gloucester.—Exhibition of photographs, photographic apparatus, and appliances, will be held during April, 1888, at Gloucester, under the control of the Gloucestershire Photographic Society. *President*—George Embrey. *Exhibition Committee*—Rev. E. Bamford, W. Gillard, Dr. Hodges, W. J. Jenkins, A. H. Pitcher, W. B. Wood. *Financial Secretary and Treasurer*—H. S. Crump. *Hon. Secretary*—F. H. Burr, 8, Midland Road, Gloucester. *Conditions.*—1. Each exhibitor will be charged an entrance fee of 2s. 6d., and be entitled to a season ticket, not transferable. 2. All pictures must be mounted and framed; labelled on the back with particulars of subject, process, exhibitor's name and address, and if for sale, the price including frame, subject to 10 per cent. commission. The committee reserve the right of rejecting any picture or pictures. 3. Carriage both ways must be paid by the exhibitor. Great care will be taken of the exhibits, but the Society will not be responsible for any untoward accident, except loss by fire, which will be provided for. 4. In the amateur classes the exhibits must be the sole work of the exhibitor: exposure, development, printing, toning, and mounting. 5. The form of application for space can be obtained from the Hon. Secretary, and must be filled up and returned not later than the 29th February, 1888. The Committee will be pleased to receive for exhibition any interesting specimens of photographic art, or apparatus, &c. The following medals and certificates will be at the disposal of the Judges, who reserve the right to withhold any medal or certificate on the ground of insufficient merit:—Class (1) Portraiture—One silver, one bronze medal, one certificate; (2) Landscape or Seascape, Professional—One silver, one bronze medal, one certificate; (3) Landscape or Seascape, Amateur—One silver, one bronze medal, one certificate; (4) Landscape or Seascape, Amateur—Frame of not less than six from quarter plates, silver medal, presented by the editor of the "Amateur Photographer" (see Condition No. 4), preference given to prints from untouched negatives; (5) Best Landscape Picture, any size, from negative on Messrs. S. Fry and Co.'s plates—Silver medal, presented by Messrs. S. Fry and Co., Limited; (6) Best Series of Six Contact Prints, any size, on Messrs. Fry and Co.'s Argentotype paper—Silver medal, presented by Messrs. S. Fry and Co., Limited; (7) Architecture, Professional—interior or exterior—One silver, one bronze medal, one certificate; (8) Architecture, Amateur—interior or exterior—One silver, one bronze medal, one certificate; (9) Genrè or Figure Picture—One silver, one bronze medal, one certificate; (10) Enlargements, not Portrait—One silver, one bronze medal, one certificate; (11) Enlargements, on Messrs. Morgan and Kidd's opals or paper, any size—One silver, one bronze medal, presented by Messrs. Morgan and Kidd; (12) Lantern Slides, Professional—best series of twelve—One silver, one bronze medal, one certificate; (13) Lantern Slides, Amateur—best series of twelve—One silver, one bronze medal, one certificate; (14) Photo Micrographs—best series of twelve—One silver, one bronze medal, one certificate; (15) Best General Collection of Apparatus—One silver medal. Communications to the Honorary Secretary, F. H. Burr, Midland Road, Gloucester.

Photographic Club.—Opening lantern night, November 30th. This evening will be devoted to the lantern exhibition. Music, &c. There will be no discussion. A limited number of admission tickets. Apply to the hon. secretary, E. Dunmore.

To Correspondents.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

⁂ We cannot undertake to return rejected communications.

Notts.—The directions are given in another place (page 739), and you should obtain the book in question—"Platinotype," by Pizzighelli and Huebl, translated by Iselin, and edited by Abney. The price is 2s., and the publisher is Harrison, of 59, Pall Mall.

Cuivre.—1. Merely a metal vessel with flat top, in which water was kept boiling. 2. Hughes and Kimber, printers' brokers, West Harding Street, Fetter Lane, London. Write for a price list. 3. Yes. 4. As far as we know, they are not made commercially. 5. Yes; an ordinary scale-board. A hat-box inverted over the plate answers very well. 6. Of late, only some short articles which have appeared in the PHOTOGRAPHIC NEWS. 7. It is very good of you to offer to lend us the book, and in a few months we will take advantage of your kindness, as then we hope to have leisure to make some notes from it.

A SINGAPOREAN.—It is, in fact, pyroxyline in a compact or compressed form, but ordinarily contains a trifling amount of alcohol which has been used to make it agglomerate; so it may be that a little extra may be required—perhaps five grains and a-half to the ounce instead of five grains.

W. S. A.—1. About 12 by 20 feet. 2. Two-thirds of the length, and half the corresponding part of the roof. 3. Two feet is enough. 4. A light material like gauze can be obtained from any large draper.

SIDALS ROAD.—1. You had better simply float it on the warm solution, say at a temperature of about 130° F; but the insolubility of the film arises from the reducing action of the alcohol upon the bichromate. We have found this to happen when insufficient ammonia has been used, when the mixture was not used immediately, and in one case, when a very foul-smelling sample of methylated spirit was employed. A little borax added to the development water will go far to compensate for the mischief. 2. See the third article in Major Waterhouse's series. 3. If so, let him show one of his paintings, in order that each may form a judgment. Perhaps even the Academy may take one. 4. We think you are wrong, but we will further investigate the matter, and let you know the result. 5. As regards this point, we certainly were mistaken, and we have informed the persons concerned. 6. Unless the gelatine is a very soluble kind, such an addition will cause precipitation. 7. It is not our custom to insert any letter unless over the name of the writer, consequently your letter does not appear this week; but answers in this column are given alike, whether the letter to us is signed with a real name, or one assumed for the occasion.

J. HORNE.—1. Only a trifling amount—about one part in two hundred and fifty. 2. Alcohol will remove it, but if you use methylated spirit there may be some chance of discolouration. 3. The sulphate of barium is insoluble in water, so there must be some mistake.

KENTISH MAN.—The Eastman stripping film will probably suit you, as, if you leave it upon the glass support, the negative will be a reversed one.

I. H. H.—1. As regards the camera, your best way will be to select the pattern which you think most likely to be convenient to you personally, bearing in mind that an instrument of which the ground glass is exposed must be carried in a rigid case. You cannot do better than go to one of the established English makers for a lens. 2. Imperfect fixation; both paper and albumen are rather hard, and, moreover, the action of the hypo is slow during the cold weather.

WALTER L. NASH.—New glue of good quality has proved most suitable in our hands.

CURIEUX.—1. A very suitable book for you to obtain is Abney's "Instruction in Photography." 2. Try the method described on page 433 of the NEWS dated July 15 last. 3. Use it after fixing if the gelatine will allow of it; otherwise rinse it away pretty thoroughly before putting in the hypo bath. 4. Equal parts of a saturated solution and water; but a considerable variation is allowable.

A SUFFERER.—See the YEAR-BOOK.

W. BUTTS.—It is a very successful little picture, and we heartily congratulate you.

E. DOYLE.—Thank you for sending it. It is not to hand as we pen this, such packages being often a post or two after the letters.

A. M.—We will send you a Continental periodical which may guide you in the matter.

CAMBRIAN.—1. One in which the back moves. 2. We have not seen it.

BRIGHTONIAN.—1. About half a crown an ounce 2. Hopkins and Williams, Cross Street, Hatton Garden, London.

W. GUTTENBERG.—1. We do not publish the book; indeed, we have never seen it. 2. Flood the plates with the same gelatine solution in which you soak the prints. 3. The sort of gelatine used for soaking the prints is not very suitable for mounting, as it will set too quickly. Glue of good quality is more suitable for this latter use. 4. Cut them with a steel die or an American wheel cutter. 5. Far less than is generally recommended will answer—one part in thirty being sufficient. Your stamps have been returned, as no charge is made for information given in this column.

J. DICKINSON.—No.

JOHN SERGEANT.—They are excellent, and have been returned according to request.

S. G. H.—Thank you very much for the permission, of which we shall gladly avail ourselves.

W. M.—1. Use Simeon's gelatine. 2. The following conditions tend towards what you require:—(a) An addition of calcium chloride to the mixture—say thirty grains to the ounce; (b) a thick film; (c) drying at a high temperature.

WALTER A. NASH.—A very long exposure always results in the production of a positive, but this reversal of the action takes place more readily with some plates than with others.

J. M. A.—First read, then attempt to translate your reading into action. Each failure must be investigated to the best of your opportunities, both in the ways of experiment and questioning those who have had experience.

COL. NOVERRE.—Thank you for the specimen of backing stripped from the film. The action is curious, and merits careful investigation.

CARBON.—1. You said nothing about collodion in your previous question. If you use collodion you should immerse the plate in water as soon as the film has set, and it will be ready for use as soon as the water runs off without leaving streaks. 2. Never strengthen the bichromate bath, but make a fresh one. 3. Yes. Prevent it by keeping the tissue quite dry. 4. Streaks on carbon prints arise from so many causes that we can make no suggestion without seeing a print.

E. D. S.—1. If you can do first-class work, and have business ability, the probabilities of success are great. 2. Yes; if you go in for the reproduction of Continental scenery.

LENS.—As far as we know, the lenses sold under this name vary a little as regards the angular aperture with the largest stop; still, if the maker sells you one as $\frac{f}{6}$, and it is not so, you will have just cause for making a claim against him. 2. We have never tried a lens by the maker, so cannot say. 3. Not having seen the instruments we cannot answer the question; still, we have worked with the instruments of the older maker, and have found them excellent. 4. In the case of any lens of this type, either combination may be used separately, but there will be a certain amount of distortion—pincushion distortion if front combination is used with the stop behind, and barrel-like distortion if the back combination is used with the stop in front.

T. R. W.—We do not think it is sold now, and we are under the impression that the patent has lapsed. You can ascertain as to the latter point by referring to the list at the Patent Office Library.

GLEANER.—The question as to selling the poisonous chemical is one concerning which conflicting decisions have been given, much turning on the nature of a "wholesale transaction."

C. R. S.—You will be liable to a penalty if you describe yourself as such without being duly appointed.

H. ALEXANDRA.—Perhaps you can get them made to order by Marion, but of this we are not sure.

Photographs Registered.

W. J. BYRNE (Richmond)—10 Photos. of the Duchess of Albany; Photo. of the Duke of Albany; 2 Photos. of the Princess Alice of Albany; Photo. of the Duchess of Albany and her two Children; 5 Photos. Groups of Duke and Princess Alice of Albany.

W. S. FOTHERGILL (Stockton-on-Tees)—2 Photos. of Scenes in Kabylia.

W. V. AMEY (Landport)—2 Photos. of the Rev. E. Holroyd; Photo. of Charles Bradlaugh, M.P.

G. MOLD (Banbury)—2 Photos. of the Interior of St. Mary's Church, Banbury.

H. R. SHERBORN (Newmarket)—Photo. of a Drawing by J. Bor.

JACKSON BROS. (Middleton Junction)—3 Photos. of Boys at Play.

J. D. HANNAH (Shrewsbury)—Photo. of a Dog.

J. A. KAY (Bolton)—Photo. of Jacob Bright, M.P.

E. REEVES (Lewes)—Photo. of the Banner of the Gundrada Habitation of the Primrose League.

T. ERWIN (Ballymena)—3 Photos. of the Rev. C. Davies.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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WHY HAVE SOME NEGATIVES THIN EDGES?

This is a question that comes to the front now and again, and it generally receives a goodly assortment of answers. An inferior emulsion, bad coating, the surface of the glass being concave so that the emulsion runs to the middle of the plate, uneven development, and perhaps other possible causes are suggested to account for the evil; but in many negatives that we have recently seen we have traced the cause to the unsuitableness of the lens for the work that was expected from it, and, further, to the unwise use of the lens. Many of the detective cameras now constructed with lenses complete yield negatives which are defective, more or less, in the way that we are about to refer to.

It is a well known fact that when the working aperture of the lens is less than the length of the plate, a pencil of light of given angle covers a larger space at the edges of the plate than at its centre, because in the one case the pencil impinges perpendicularly upon the plate, and in the other case obliquely. This causes a thinness at the edges of the negative, but the effect is slight except when a wide angle is included in the picture. The fact, also, that the oblique pencil passes obliquely through the diaphragm gives another reason why the edge of the plate is less intensely illuminated than its centre. Practically these defects must be borne with, for the only remedies that seem to have been suggested have not proved acceptable. A concave plate will obviate the obliquity of the pencil, and many years ago Mr. Sutton made a diaphragm with wings to it, so arranged that they tended to reduce the perpendicular pencils of light and to allow the oblique pencils to pass without interference, so, in a measure, equalising them.

Under ordinary circumstances, however, these effects are so slight as to rarely be troublesome; but the point of these remarks is that this tendency to the falling off of the light at the edges of the plate exists, and that to secure an evenly illuminated plate it is necessary to avoid exaggerating this tendency.

If a lens has an aperture equal to the diameter of its combinations it cannot cover a plate much larger than its own diameter without a considerable falling off of light at the edges, due to this circumstance. This is clearly shown by looking at such a lens from the position of the focussing screen. If the eye is brought to the corner of the screen, the aperture of the lens will be seen to be much reduced by the mounting of the lens. The largest diaphragm that allows its whole aperture to be seen without interference from the mount, is the largest aperture that it is advisable to use when an evenly lighted plate is desired. An aperture larger than this aggravates the tendency to thin edges. It will be found that a similar lens of longer focus will allow of a larger proportional aperture; but a larger lens means one that is more expensive and heavier, and the change is therefore incompatible with cheapness and lightness. The diminution of cost and the lessening of weight are very desirable items in all portable apparatus; but the quality of work ought not to be allowed to suffer for the sake of a little saving in these things.

In some apparatus of the sort under discussion, the shutter is so constructed that it also tends to reduce the illumination at the edges of the plate. Probably all shutters working outside the lens, if they open from and close to the centre, give an exposure that begins and ends at the centre of the plate. A rectangular opening passing in front of the lens at a uniform rate gives an exposure of equal duration to the whole lens surface; or if the shutter works on a centre and the aperture is bounded by radial lines drawn from the centre, the same result is obtained. A circular aperture sliding in front of the lens tends to rob the edges of the plate of some of the light that it might otherwise receive.

In drawing attention to these points we are only reiterating what has been said before. In our columns of fifteen years ago, E. L. Wilson, in his American correspondence (*Photo. News*, vol. xvi., p. 17), quotes from the well-known optician Zentmeyer concerning the erroneous notions more or less prevalent about exposure shutters. We have given the chief points of his remarks above.

We cannot too strongly urge the makers and users of photographic apparatus to get to know so much of the principles of its construction and action that they may know how much of fault it is possible to eliminate, and how to use suitable apparatus so as to secure the best results that are attainable.

◆

THE CELLERIER-PARKES AFFAIR, AND THE PHOTOGRAPHIC COMPANY, LIMITED.

We have received the following letters:—

Dear Sir,—With reference to your comments on the recently issued prospectus of the Photographic Company, Limited, I would point out to you that the error is due solely to inadvertence. The advertisement was printed from the original proof, and not the revised version of the prospectus. If you will refer to the extracts in the prospectus from the *Times* and *Daily Telegraph* you will see that there was no intention to deceive.—Yours obediently. J. H. Hayward, Secretary.

58, Lombard Street, E.C., Nov. 29th, 1887.

Dear Sir,—Referring to your article in last week's issue of your journal, I can assure you and your many readers that the directors of the Photographic Company are in no way responsible for, and are greatly annoyed at the error which was unfortunately made by the agent who drew the abridged prospectus. The draft prospectus was submitted to me on behalf of the new board, and remembering well your past and present opinions as to the proper description of the Cellerier-Parkes process, I took special pains to erase every word of a misleading or questionable nature, especially the words "photographing" and "photography." Immediately I saw the advertisement I, on behalf of the directors, gave notice to the agents to withdraw all such advertisements and remove the objectionable words—viz., photographing and photography, and this was promptly done. The abridged prospectus clearly shows that there is no intention to deceive, for it cites the papers which describe the process as for "producing coloured photographs" (*vide Times*) and explains the "method of colouring." Again, it mentions that the profits of the Company will be derived from (*inter alia*) "The photographs by the new process. . . . . Also from production of photographs in colour from negatives taken by professionals or amateurs. . . . . The Company's coloured photographs can be delivered, &c. . . . . The photographs are permanent, no surface colours or dyes being used."

I enclose you the prospectus as settled by me (accompanying application forms) from which you will observe that the processes are described in plain and proper language, and without any attempt to deceive or mislead anyone. It will be the directors' earnest endeavour to remove all false impressions or misrepresentations, as they are confident the patents will succeed on their own merits. Thanking you in anticipation for inserting this letter, I am, dear sir, yours faithfully,

E. W. Parkes.

3, Salter's Hall Court, London, E.C., Nov. 28th, 1887.

The revised circular sent by Mr. Parkes contains the following :—

See fiyleaf herewith for extracts from the following newspapers—viz., *Illustrated London News, Queen, Photographic News, British Journal of Photography, City Press, Public Opinion, Money, Scottish Leader, Citizen, Industrial Review, Land and Water, Sportsman, Brighton Gazette, The Hatters' Gazette, Engineering*, and opinions of Mr. Ruskin and Mr. George Augustus Sala."

This is from the accompanying flyleaf :—

Photographic News, *June 10th*, 1887.

We are pleased to be able to say that the average excellence of the photographs themselves is high, and the colouring is, on the whole, equal, and perhaps superior, to that of other collections of photographs coloured by analogous means. In some instances the work of colouring is really of high merit. There is certainly a prospect of the Syndicate doing a large and remunerative business.

The sentences from which the above is taken are in their unmutilated form as follows :—

We are pleased to be able to say that the average excellence of the photographs themselves is high, and the colouring is, on the whole, equal, and perhaps superior, to that of other collections of photographs coloured by analogous means. In some instances the work of colouring is really of high merit—indeed, nearly as good as the photographs tinted in water-colour which are sent out by the best photographers who employ good artists. There is certainly a prospect of the Syndicate doing a large and remunerative business, provided they can create a taste for their productions, and if they have at their command capital, energy, and skill enough to compete successfully with those photographers who are already established.

We regret that our correspondents do not say that subscribers have had the option of receiving back their money.

◆

COMBINATIONS OF SILVER CHLORIDE WITH OTHER METALLIC CHLORIDES.

BY M. CAREY LEA.*

In a series of papers lately published, I have expressed the view that the principal and characteristic product of the action of light on the silver haloids is a combination of the haloid with a small proportion of its own subsalt. Such was the result of my own analyses, and the opinion was supported by the tendency which the silver haloids were found to have to unite with foreign matters, such as many dyes and other organic compounds, showing the existence in these silver haloids of a singular disposition to form compounds outside the laws of atomic proportion.

This opinion finds additional support from another argument and a more nearly parallel case, for it appears that silver chloride (and doubtless the other silver haloids) can unite with small quantities of certain other metallic chlorides. That an actual combination—though one quite outside of atomic proportion—takes place, is proved by two facts ; first, that the chloride with which the silver haloid unites, though soluble in water, is not removable by water; again, that the properties of the haloid are markedly changed.

This combination with another metallic chloride furnishes a much nearer parallel case to the photo-salts than does the combination with a dye. For if silver chloride is found to be capable of taking up a small quantity of ferric or other chloride, and of retaining it so firmly that it cannot be removed by washing, and only with some difficulty by hydrochloric acid, we are thereby justified in admitting that the silver haloid may easily form a stable combination with a small proportion of its own subsalt.

In all these compounds the tendency seems always to the combination of a large proportion of the silver haloid with a small one of the other substance, whether the latter is a dye, another chloride, or a silver sub-salt—all show the same disposition, so that I am justified in saying that my view of the nature of the photo-salt is supported by the existence of many analogous bodies.

These compounds of silver chloride and other metallic chlorides form when the silver haloid is in presence of their solutions at the moment of its precipitation.

AgCl *with* $Fe_2 Cl_3$.—When to dilute hydrochloric acid is added, first, ferric chloride, then solution of silver nitrate, the silver chloride thrown down is not white, but buff-coloured. The ferric-chloride, which has united with the silver chloride, cannot be removed by washing. Agitating with hydrochloric acid dissolves out part, but not all. It is very interesting that this small quantity of iron profoundly affects the sensitiveness of the silver salt to light. To make an accurate comparison, two solutions of silver chloride were precipitated, the one from pure hydrochloric acid, the other from hydrochloric acid mixed with $Fe_2 Cl_3$; both were shaken up with hydrochloric acid, so as to remove all the more loosely combined iron salt from the one, and to place the two under exactly corresponding conditions, the presence of the iron salt alone excepted. They were then washed. When both were exposed together to light the difference was extraordinary. The normal AgCl had passed to a full violet, with an exposure which produced on the other scarcely any visible effect. Even after an exposure to diffuse light of two hours, the difference was still very striking.

AgCl *with* CoCl.—When cobalt chloride is added to hydrochloric acid, and then solution of silver nitrate, a pinkish precipitate is obtained, whose sensitiveness to light is less than that of normal silver chloride. But the diminution of sensitiveness is far from being so great as in the case of AgCl precipitated in presence of ferric chloride.

AgCl *with other Chlorides.*—Both nickel chloride and manganous chloride attach themselves to silver chloride when the latter is precipitated in their presence. Cupric chloride seems to have no such tendency. Gold chloride shows a marked tendency to attach itself to AgCl. When silver nitrate is added to dilute hydrochloric acid, with which a little auric chloride has been mixed, the precipitated AgCl has a reddish shade. Continued washing renders this paler, but does not seem to remove it. After ten decantations, each with a hundred volumes of water, the colour imparted by the gold is still visible. What influence the auric chloride has on the sensitiveness of the silver salt it is not easy to say, as the gold present is quickly reduced by exposure to light, so that the AgCl, instead of passing to violet and chocolate, as in the case of pure AgCl, gradually darkens to a pure black.

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* From the *American Journal of Science.*

The facility with which these compounds are formed explains the necessity in analytical determinations of silver as chloride, for digestion for a considerable time with dilute hydrochloric acid. Even then it is very doubtful if all the foreign chloride is removed. Ferric chloride is especially adherent. Indeed, it has been said that when iron once comes into contact with silver it is next to impossible to get rid of it, and the reason lies in the strong affinity which the two chlorides have for each other. Accordingly much silver nitrate sold as absolutely pure contains iron evidently carried down with the silver chloride when precipitated in the manufacture.

These reactions of $AgCl$ are interesting in several ways. They support the theory I have proposed, of the photosalts being compounds of two chlorides of silver not combined in definite proportions, by establishing the existence of other analogous compound chlorides.

Again, the sensitiveness to light of $AgCl$ is so strongly modified by mere traces of ferric chloride, that evidently a quantity of the latter substance, quite too small to visibly affect the colour of the $AgCl$, may materially change its sensitiveness, thus affording an illustration of what takes place in the latent image, where the presence of a quantity of Ag_2Cl, too minute to be visible, is sufficient to powerfully influence the substance combined with it.

It also furnishes an explanation for a well-known fact that has hitherto seemed anomalous. It has long been known that a trace of mercuric chloride suffices to greatly diminish the sensitiveness of silver chloride to light. This isolated fact now becomes simply one of a series. $AgCl$ combines with a small proportion of mercuric chloride just as it does with other metallic chlorides—those of the iron triad, for example—and does not give it up when washed.

Debray (quoted in Gmelin-Kraut, article Silver) has, indeed, expressed the opinion that the mercuric chloride can be entirely removed by washing with water. To fix this point I have sought for a convenient means of detecting small quantities of mercuric chloride in presence of $AgCl$, and have found it in a solution of stannous chloride made strongly acid with HCl. Pure $AgCl$ is not darkened by this reagent, provided that light is carefully excluded, but if mercuric salt is present, a brown or brownish black colouration results. Long washing has with me wholly failed to remove the mercuric salt. I therefore look upon the combination as one of considerable stability.

All these combinations diminish the sensitiveness of $AgCl$; but this effect is greatly stronger with those chlorides which easily part with one equivalent of chlorine, as we saw in the case of ferric chloride. Mercuric chloride acts in the same energetic way.

It seems, indeed, that the reduction of sensitiveness in these cases is somewhat out of proportion to the amount of chlorine that could be yielded up by the trace of the foreign chloride which is combined with the $AgCl$. But this is, perhaps, to be explained by this trace of chlorine holding in check the initial movement toward reduction.

It is worth observing that experiment and observation are constantly tending to enlarge the number of substances with traces of which the silver haloids show themselves capable of uniting, with great modification of their properties as a consequence.

The reduction of sensitiveness that results from the presence of certain other chlorides will undoubtedly in the future be of great value in aiding toward a solution of the problem of rendering permanent photographic images in natural colours. Indeed, it was Poitevin, I think, who found that his coloured images resisted light better when treated with lead chloride and dextrine. The property was observed, but the nature of the action remained obscure. We now see its explanation in the tendency of the lead salt to check reduction. Zinc chloride I found available, like lead chloride, to regenerate white silver chloride by the action of light on coloured photo-chloride, and thus to give aid towards that very difficult requirement in heliochromy—that white light shall express itself by producing white.

NOTES FROM NEW YORK.

The Triplex Photograph.—Death of Charles Taber.

Quite recently Mr. George G. Rockwood, of this city, one of our most enterprising and popular photographers, has introduced a new style of photograph, called the "Triplex." Upon one plate in the camera he takes three successive panel or carte-de-visite negatives of the person in three different positions, giving each a uniform exposure, so when the plate is put in a uniform developer, each picture develops out simultaneously. He also undertakes to take photographs of card parties, &c., at night by the new flash process. The following is what he says about it :—

"*Photographic Portraits at Home.*—Through the efforts of a distinguished scientist of this city, we are enabled to avail ourselves of a new and wonderful artificial light which is not only portable—in fact, can be carried in the pocket-book—but enables us to make instantaneous pictures at night in ordinary dwelling houses. The first practical application of this new invention was made at our establishment, and some thousands of pictures have already gone out to the world. Parties desiring photographs of family groups, companies, card parties, &c., can have them instantaneously photographed at their residences without any other preparation than can be made in a moment after the arrival of our operator at their houses. The cost is ten dollars for one dozen cabinet portraits; five dollars per dozen for duplicates. No head-rest or other paraphernalia of a photographic establishment are required; our operator simply carries a small portable camera and the compound for lighting the group. The whole matter is done in an instant, and the most satisfactory results are obtained. This also is unique, and not done by any other establishment in the United States."

On the 17th of November Mr. Charles Taber, well known in this country for his high class of photographic reproductions of art work, died. The following is a brief account of his life :—

"Charles Taber, the well-known art photographer, of New Bedford, Mass., died yesterday morning at his home in that city, where he was born in 1822. Mr. Taber came of Quaker stock, and was himself a member of the Society of Friends. He was educated at Haverford College, in Pennsylvania, and for many years was engaged in the book trade in his native place. He then turned his attention to photographic work, and about 1865 introduced the ambrotype, which was at that time the highest form of the art. He applied it with peculiar success to the copying of works of art, and his reproductions of fine paintings, engravings, and statuary attained a deserved popularity. His business at once became very extensive, and at the present day his house is the leading one of those devoted to art photography." Mr. Taber was a man of restless energy, and was engaged from time to time, with almost invariable success, in a variety of commercial enterprises in addition to his main business, and at the time of his death was interested in whaling operations on a large scale. He possessed a kindly disposition, which made friends for him everywhere. As a merchant he was upright and honourable, while his large fund of information and a literary ability of high order made him a delightful companion. He leaves a widow and five children in very easy circumstances, his accumulated wealth being considerable, while the business will be carried on by two of his sons."

The latest method of making lantern slides by magnesium flash light, is to place the compound on a brick about 18 inches from the negative, and interpose a ground glass in front of it. Care must be taken not to use too much magnesium, otherwise over-exposure will result. An $\frac{f}{16}$ stop can be used. Sulphite.

N. Y., Nov., 1887.

DOWNES V. FALLOWFIELD.

This important case, the decision on which will in all probability form an important precedent in regard to the relations between photographers and photographic dealers, came on for hearing on

Thursday, November 24, at the Court of Queen's Bench, and a special jury. The plaintiff, who is a photographer at Sleaford, was represented by Mr. H. D. Greene, Q.C., and Mr. W. Graham; the defendent, the well-known photographic dealer of Lower Marsh, Lambeth, by Mr. Finlay, Q.C., Mr. E. Pollock, and Mr. J. Shaw. The action was to recover damages sustained by plaintiff, arising out of the use of certain card mounts supplied by defendant, which cards, it was alleged, were unfit for the purpose for which they were sold. The defendant denied the alleged warranty. The damages were laid at £500.

Mr. Greene, in opening the case, said that Mr. Downes had purchased a quantity of carte-de-visite and cabinet mounts of Mr. Fallowfield, probably believing that the latter manufactured them, whereas it turned out that they, like almost everything else, came from abroad, and that the German was, as usual, behind the scenes. These mounts were ordered by the plaintiff in 1884, and, in the course of time, were used. Mr. Downes employed a printer, who was a skilled photographer, and the photographs, mounted on the cards in question, passed through his hands. After a time, a great many complaints came in from Mr. Downes' customers that the photographs mounted on the defendant's cards (which had printed on them the plaintiff's name), in the course of a few mouths became covered with white spots the size of the point of a pin. I have, said Mr. Greene, a great number of specimens here to which I shall have to call attention. This photograph represents a very lovely young lady suffering from well-developed small-pox (laughter). Here is another in which the parties appear to have been taken in a snowstorm. In a third case, where a wedding party was photographed, the mother's eyes appeared some time afterwards to be filled with tears (laughter). A fourth seemed to be attacked by leprosy. These spots did not appear in one or two instances, but in all the photographs which were mounted on defendant's cards. Complaints were made to Mr. Fallowfield, but, before doing so, the plaintiff took pains to see what was the cause of the defect. He made a test of this kind. He cut a photograph in half; one half was fixed to one of defendant's mounts, and the other to a mount of a different dealer. In the former case the spots appeared, and in the latter they did not. It was also found that the rapidity with which these spots appeared depended upon the amount of exposure to air and to light. If enclosed in an album, the photograph did not show the spots for many months; but if not so protected, it exhibited the defects in a much shorter time. Some time therefore elapsed before the extent of the imperfections was made evident, and on September 1st, 1886, the plaintiff wrote to defendant, complaining of the cards, and stating that after having been tested in London, it was found that every mount was covered with minute particles of common bronze powder, which had caused the spots complained of. The plaintiff added that he should have in every case to replace the damaged prints, besides which he had been injured in his professional reputation, and knew of cases where he had suffered loss of work in consequence. He held that defendant was legally responsible, but did not wish to take legal steps if the matter could be arranged. It is perfectly obvious, continued Mr. Greene, that if a photographer supplies photographs which behave in this manner, it must be perfect ruin to the photographer, because no one would care to go through the operation of being photographed with the result that they would have to throw the photographs behind the fire. To the plaintiff's letter Mr. Fallowfield replied, regretting the occurrence, and stating that directly he heard from the maker of the cards he would communicate with plaintiff. He also offered to send plaintiff another 5,000 cards free of charge. This offer, however, Mr. Downes refused to accept, as through bitter experience his faith in defendant's cards was destroyed, besides which 4,000 photographs on these cards were distributed broadcast about the country, and there was no knowing the danger they were doing him. In addition, he had been put to the expense of advertising and printing circulars to his customers. In conclusion, the plaintiff wrote that if defendant's offer did not meet his views he should have to place the matter in the hands of his solicitor. In reply the defendant sent a letter from Messrs. Carl, Ernst, and Co, the manufacturers, who said, "That while we cannot deny the possibility of there being bronze powder, perhaps, on a few of the cards, we do not know how it is probable it should be the case with all of them. As a matter of course we do not doubt the veracity of the statement, but you must apprehend how curious it is, as we are printing millions of cards." Messrs. Ernst concluded by offering to replace the cards. The German manufacturers, therefore, did not dispute the position taken up. They did not suggest there was any other cause of the spots. He (Mr. Greene) would ask the jury to bear this fact in mind, because in answer to a letter from Mr. Downes, declining to accept defendant's offer, the latter stated that he could not depart from his terms, and expressed his belief that the cause of the spots was in the starch mountant, a material which all the leaders in photography discountenanced as having a deteriorating effect. Up to this time Mr. Fallowfield had not seen the photographs in question, and, notwithstanding the letter of Messrs. Ernst, he contended that the cause was due to the starch. This theory, moreover, was disproved by the test applied by the plaintiff already referred to, the same starch being used in both cases. Other tests, however, were applied. The assistance of scientific men was called in; the cards were examined under the microscope, the spots were pricked with a pin, and upon the pin was found a trace of copper. No clearer demonstration of the cause of the spots could be imagined, and it was quite possible that the whole of the cards were affected in this manner, although it might be that a few were not. Mr. Spiller had examined a large number of the mounts taken haphazard, and had found the bronze powder over and over again. If the jury considered the scientific evidence he should bring forward satisfactory, he ventured to submit that the whole question would resolve itself into one of damages only. The cost of reproducing the photographs on the cards used at the ordinary rate would be £37 for the cabinets, and £110 for the cartes-de-visite. Perhaps some of the photographs might not come back, but in any case the plaintiff had got to make all those that did good. It was quite possible the Germans were fighting the action, as their reputation as mount manufacturers was being jeopardised. But equally so was the plaintiff's business, as the vendor and supplier of these photographs. The defendant might, of course, try and throw the blame upon the mountant, but after the manufacturer's letter he thought this was scarcely possible.

Mr. Downes was then examined by Mr. Graham. His evidence bore out the opening statement of counsel. The orders were for 5,000 carte-de-visite and 1,000 cabinets in June, 1884, and 1,000 cabinets in 1885. Roughly speaking, he had used up about 3,800 cartes, and about 1,930 cabinets, leaving about 2,000 mounts in stock.

A number of defective photographs were then handed up for the inspection of the judge and jury, and marked for convenience of reference. The photograph mounted by plaintiff on a card not of defendant's make was also handed up.

Examination continued: As far as he could test the matter, plaintiff could say that the spots did not result from the mountant. He had prints in his possession from the same batch as those mounted on defendant's cards but mounted on different cards, as fresh as on the day they were produced. They had gone through precisely the same manipulations, and had been mounted with the same material and at the same time.

The Judge: Have you had any photographs give spots except those on defendant's cards.

Witness: Never in my life.

By Counsel: He had sent out 3,000 cartes, and had had a great number of complaints.

The Judge: Have they all complained?

Witness: No, I cannot say the whole of the customers have, but I have had complaints from a very large number, and also complaints from other customers to whom copies had been given for their albums. He should say he had reprinted about 130 cabinets and about 136 cartes, but the complaints had been much more numerous than these figures represented. The matter came to such a pitch at last that he had to ask customers to allow him time while the action was pending.

Mr. Graham: In addition to the loss on these photographs, is your general loss of business—

Mr. Finlay: I must object. General loss of business is not in the statement of claim.

The objection was allowed.

Mr. Graham then read the correspondence alluded to in Mr. Greene's opening speech. In reply to counsel, witness said that on all the photographs his name and address were printed.

Mr. Graham: That being so, do you put injury to your business—

Mr. Finlay: I must object to that.

The Judge: Yes, that is a question for the jury.

Cross-examined by Mr. Finlay; The absolute money value of the photographs he had reprinted was £9 14s., but he had plenty more to supply, and had supplied many more since the statement of claim was made out, which was in April last. He received the first lot of cards in June, 1884, and complained to defendant in September, 1886. It took a considerable time for the spots to develop themselves, and he did not begin to use the cards until about February, 1885. Had dealt with defendant for some years, but did not think he had given him more than three orders for cards. He had no reason to complain before the order of 1884. After February, 1885, he was using Fallowfield's mounts, the only others being Marion's plaque mounts. The mounts ordered in September, 1885, were supplied in November, and he began using them almost immediately. The complaints of the mounts used in February, 1885, and afterwards, began to come in about January or February, 1886. He was able to say that the cards of first order had defects, because complaints came in before the second lot was ordered. He could not say when complaints of second lot began to come in. The statement made in his solicitor's letter that "letters were coming in by almost every post," complaining of the photographs, was not quite correct. He had only got two letters in his possession, but before he knew the cause of the spots he had had many more which had been destroyed. The statement should have been not "letters," but "complaints," which were continually being made verbally by people in the town.

Mr. Finlay : Do you not know that spots on photographs are extremely common ?—Not of this description.

Will you look at this unmounted photograph ?—This is by a different process—gelatino-bromide.

Are these not spots similar to those complained of ?—They are produced in development.

Are they not similar ?—Certainly not.

The Judge (looking at the bromide print) : You say the spots are not of the same description.

Witness : They are produced by the print being placed in an acid bath, which this kind of photograph requires. If the acid is not washed out, the fixing bath will produce spots.

Mr. Finlay : Do you suggest that the spots are due to the bromide having been used ?—They are sulphurised spots due to acid.

Mr. Finlay (handing another print to witness) : To what do you ascribe the spots in this ?—In many instances to bits of dust between the negative and the paper. In this print there are three different classes of white spots.

Witness proceeded to describe these spots, some being due to dust on the negative, others to spotting out on the negative, and others to imperfect fixation. There was also a white spot with a black spot in the centre. In a second print of the same subject witness said there were white spots caused by mildew.

The Judge : This is a portrait of Mr. Gladstone. He is covered with spots. (Laughter).

Cross-examined further on the subject of white spots and their varieties, witness said, in his experience, it was not a common thing to have white spots. He did not have them until he used the mounts in question. Requested to examine some photographs by Elliot and Fry, and Downey, witness said the spots in them seemed similar to those in his own photographs. It was possible they were produced from the same cause. The spots were very few in comparison with those on his photographs.

At this stage the Judge, after examining the photographs with a large magnifying glass, adjourned the case till the following day.

Friday's Proceedings.

Cross-examination continued.—He did not know that a common cause of spots was the decomposition of the albumen on the surface of the print.

Witness then described his experiment with the half photographs already mentioned. The photographs, one mounted on Fallowfield's card, and one on Marion's, were placed side by side on a board, and exposed to light and air. Marion's remained perfect, but Fallowfield's faded and became spotty.

The Judge : Is this the kind of thing we shall have to go through. I am told there are twenty or thirty witnesses, experts, besides. If so, I am afraid it is hopeless.

Mr. Finlay : These are matters we are bound to go through, my lord. I am sensible of the difficulties, but these points are of very great importance to the defendant.

The Judge : Do you really think it is possible for twelve gentlemen to go through the details of these experiments and comprehend them ?

Mr. Finlay : We are anxious to have the case tried in the ordinary way by the jury.

The Judge : That is perfectly right, but I do not think it is possible to so try it.

Mr. Greene : Many cases of a technical nature are tried. Our view is that the case wants more common sense than anything else.

The Judge, while giving every credit to the jury for the possession of the best common sense, thought the case was not one which they could decide.

A conference between Counsel then took place, at the termination of which,

Mr. Finlay said : After discussing the matter with Mr. Greene, we have come to the conclusion that the most satisfactory way would be to refer the matter, say, to Mr. Hugo Miller, late President of the Chemical Society, and report to your lordship on this point : whether the injuries complained of arise from any defect in the cards as supplied by the defendant. Then the case would come before your lordship on the report, and the Court would then deal with the question of damages.

The Judge : That seems reasonably fair, and much more satisfactory.

It was accordingly decided that this course, under section 56, should be adopted.

FRENCH CORRESPONDENCE.

French Photographic Society—Finder for Cameras—Applications of Photography to Astronomy—Developer with Ammoniacal Sub-Chloride of Copper — Photography without a Lens — Universal Exhibition of 1889 — Photographic Excursion Society—Photography Applied to Industrial Reproductions — Central Union of the Decorative Arts—Alkaline Developer—Bibliography.

French Photographic Society.—The meetings have recommenced, after an interval of two months. For an opening sitting, there was very little of interest, but there is room for hope that products of the labours of the workers will be brought to light, and that we shall soon have something better than on this occasion.

Camera-Finder.—Amongst the apparatus shown, we noted the finder adopted by M. Darlot for his pocket camera. This instrument is not new, it even exists in the greater part of detective cameras, but it is important that it should be still more common, because it advantageously replaces other kinds of finders. It consists of a very small camera furnished with a simple lens. The image is received upon a mirror, inclined at an angle of 45°, in the interior of the camera, and is reflected upon a ground-glass placed horizontally upon the top of the little box ; a shade allows us to see the image, and to judge of the effect. For instantaneous negatives, a moving object can be followed, and the spring-shutter released at the moment when this object is on the spot on which it is desired to reproduce it. To this finder two improvements might be added. In the first place, the lens might be movable, and by the help of a lever articulated from the camera lens to that of the finder, the focus could be simultaneously adjusted. Another, less important improvement, is one that is described as belonging to a somewhat similar finder in the *Philadelphia Photographer* of September 5th. The mirror is movable on pivots, and this arrangement permits us, when the camera is placed on its side, to have the image either on a vertical or horizontal plan.

Applications of Photography to Astronomy.—Commander Moissard, the inventor of a topographical apparatus which excited much interest last year, has pointed out the means of applying photography to geodesy, by reproducing the trajectories of the sun, the moon, and the stars. He showed in support of his demonstrations, phototographs of the trajectory of the moon, obtained by leaving a sensitive plate in the dark-slide, pointing the lens to that part of the heavens which the moon has to pass over, and similarly with the stars. As for the sun, its very intense light necessitates the use of coloured screens, permitting but very little light to pass. As for the advantage to be gained by reproductions of this kind, we think that no serious use can be made of them, unless the most perfect verticality and horizontality of the plate is secured. Whether this method of ascertaining the latitude of a place can be made to replace the ordinary method seems to us, as yet, to require proof.

Ammoniacal Sub-Chloride of Copper as a Developer.—Messrs. Louis and Auguste Lumiere speak of ammoniacal sub-chloride of copper as constituting a developer of the latent image. This compound, they stated, had not produced perfect results, but it deserved to figure amongst those already known as capable of developing the latent image.

Photography without a Lens, described some time since by Captain Colson, has been tried with success by divers persons, notably by Dr. Martini, of Turin. The prints thus obtained which the Dr. has forwarded are truly remarkable, and if we did not know how they had been produced, we should have supposed that a lens had been employed, so perfect are they with the exception of a very slight want of sharpness. The aperture in Dr. Martini's apparatus was three-tenths of a millimetre. He exposed from fifteen to twenty seconds with a focal distance of twelve centimetres. Let this method arrive at perfection, and the sensitiveness of our plates be increased, and we shall come to dispense with lenses—a very curious and unexpected result.

Universal Exhibition of 1889.—In spite of all the circumstances opposing the prospects of the Universal Exhibition of 1889, preparations are carried on in France with much energy. Demands for space flow in, and already in Class 12 (photography), considerably more space is applied for than the Photographic Exhibition has for disposal. It is certain that great reductions will have to be made in the amount of space applied for by some of the future exhibitors. A retrospective exhibition of photographic art, from its birth up to the present epoch, is also in course of organization; this will form an excellent occasion for following the successive advances of the history of this art. France being the cradle of photography, interesting documents will be easy to obtain; there must, however, be in England numerous *souvenirs* of the first steps of this invention, in the country where it has had such learned adepts, and we certainly hope that the assistance of those of our English brethren who may be able to contribute to the interest of this retrospective exhibition will not be found wanting.

Photographic Excursion Society.—The Society of Amateur Photographers for the purpose of making photographic excursions has been formed in Paris, under the auspices and the presidency of M. Gaston Tissandier, the sympathetic and learned director of *La Nature*, which is well-known to your readers. This Association already includes about a hundred members, and its excursions are most interesting. The last took place in the Château and Park of Versailles, where all the excursionists were authorized to take photographs; more than 275 negatives, we have heard, were obtained. An album of the Society serves as a collection of the works of its members. This collection is useful by permitting a comparison of the process employed and the various apparatus used.

Society for the Study of Photography Applied to Industrial Reproductions.—Another association, not of amateurs, but of workers, has been formed under the title of "Society for the Study of Photography Applied to Industrial Reproductions." This Society is composed especially of attendants at our source of instruction at the National School of Decorative Arts. They have paid us the great honour of naming us Statutory President. The end pursued by the members is to improve themselves by studies undertaken in common, in the practice of the principal methods of industrial reproduction, photo-lithography, typography, photogravure, &c. The field of study is vast, but the best method of achieving success is obtained by this grouping, thanks to which the expenses are less, and the means for working greater. A room in the National Society of Decorative Arts has been placed at the disposal of the new association for its monthly meetings.

Central Union of the Decorative Arts.—Photography does not cease to proclaim itself in exhibitions where art dominates. This has just happened at the Central Union of Decorative Arts, where a good number of photographers were represented by important works. Amongst the prizes we have remarked enamel medals for excellence, awarded to Messrs. Braun and Mieusement in exchange for the silver medal which they have each obtained for merit in form and for merit in execution. This is a point which should be noted. A jury as to composition formed of artistic notabilities, has accorded to these gentlemen a recompense for something else than pure and simple execution—that is to say, for merit in form, or artistic composition; this victory is very important for the photographic art.

Formula for an Alkaline Developer.—A formula for development has been communicated to us, which appears to us excellent, and which we therefore append.

1.	Carbonate of potash (chemically pure)	6 grammes
	Distilled water	5 „
2.	Carbonate (sesqui-carbonate) of ammonia (pure)	1 gramme
	Distilled water	5 grammes

Mix these two solutions, and call it B. This mixture keeps indefinitely.

Saturated solution of sulphite of soda	25 grammes
Pyrogallic acid	10 „

Mix these two products, and call it solution A. This solution will keep without discolouration for several months. Distilled water sufficient to cover the plate is poured into a dish; it is indispensable, in order to obtain a good negative of a fine tone, that distilled water be used. Then to each 100 cubic centimetres of water add one cubic centimetre of solution A; mix it well, and immerse the plate for three minutes in the solution. Take the plate from the dish and add, drop by drop, the liquid B, taking care to mix it well. Never add B while the negative is in the dish. With this developer, no bromide of potassium or ammonium need be used. This developer enchants us because only the use of products chemically pure and of distilled water are necessary conditions for working in a regular manner. Moreover, a simple examination of this formula indicates that it should give excellent results.

Bibliography.—Photographic literature does not cease to be enriched with new works. From the library of Gauthier-Villars we have a work by Arthur Batut, in which he confirms by his own studies and hypotheses the labours of M. Galton, previously published in the Photographic News. Michelet has just published a "Practical Treaty of Photo-Miniature," by Emile Bliss. Other works are in the press, of which we shall speak as soon as they appear.

Leon Vidal.

PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Another Discoverer of Photography—Enlargements on Bromide Paper—Etchings on Box-wood Blocks—Mallmann and Scolik's New Orthochromatic Collodion Emulsion Process.

Another Discoverer of Photography.—A German newspaper, the *Kapeler Tageblatt*, has detected another antecessor of Daguerre and Niépce. This time it is a vicar who is supposed to have discovered photography six years before Daguerre. The name of this "felix heuristes" was Philipp Hoffmeister, who lived in a village near Kassel, and whose invention consisted in the following. He applied a solution of pure cochineal to unsized paper, and placed the latter into the camera-obscura. In the light parts the cochineal was soon faded by sunlight, and thus a picture was obtained, which only had to be dipped in a solution of glue in water to be fixed. "I published my invention," says the late vicar in his self-biography, "in 1833, in the *Allgemeiner Anzeiger der Deutschen*, and recommended further experiment. But it interested nobody until in the year 1839 the invention of Daguerre astonished everybody. The editor of the *Allgemeiner Anzeiger*, M. Hennicke, of Gotha, disputed vivaciously for the right of priority in my favour, and a great many persons, even in England, were now desirous of explanations. I had, however, not continued the experiments, and almost forgotten the matter; therefore I could and would give no instruction. Thus the *Kapeler Anzeiger.* I leave it to the knowledge of the readers to decide if the pictures thus obtained could lay claim to be called light pictures, or photographs above all, if they could have been permanent; but in my opinion Daguerre and Niépce have nothing to fear for their fame as discoverers of photography.

A Successful Method of Obtaining Enlargements on Bromide Paper.—The following method is worked with much success in one of our largest photographic establishments. To prepare the bromide paper, the sheet to be treated—Saxe paper is preferred—is placed, the smooth side down, into a solution of

Distilled water	720 c.c.
Potassium bromide	11 grammes

and allowed to remain there for two or three minutes, when it is dried. A greater number of sheets may thus be prepared in advance. The bromized paper is then immersed in the silver bath, so as to wet both sides of it, for a period of about five minutes. Before immersing the paper, the bromized side should, however, be marked with a lead pencil or in some other way. The silver bath has the following composition—

Nitrate of silver	22 grammes
Citric acid	3 ,,
Distilled water	720 c.c.

The sheet is then thoroughly dried. The paper is exposed until the half tones are faintly visible. The time required for exposure is, however, governed by the character of the negative. The exposed paper is first floated for a short period on a weak silver solution (1 : 20), and is then immersed in the developer, consisting of a saturated, carefully decanted solution of gallic acid at a temperature of 77 to 100°. Only such a quantity of the solution should be poured into the dish that the bottom is just covered. The exposed paper, with the face down, is evenly placed on the warm developing solution, the dish being gently rocked until the development is complete. Then it is thoroughly washed, and placed into the following toning bath—

Chloride of gold	1 gramme
Chloride of ammonium... ...	10 grammes
Potassium sulphocyanide ...	10 ,,
Distilled water	200 c.c.

For use, add 2 to 3 c.c. of this solution to 1000 c.c. of distilled water. In this bath the paper is toned. If the toning proceeds too slowly, more of the gold solution must be added. The print is next fixed for about fifteen minutes in a solution of hypo 1 part, water 10 parts, then it is well washed. If it is desirable to impart to these enlargements on matt surface paper the character of those on albumen paper, they are simply albuminized. For this purpose, the whites of fresh eggs—about 250 c.c. of albumen, to which are added 125c.c. of distilled water and two to three drops of glacial acetic acid—are beaten up into a froth, allowed to settle, and then the clear liquid is filtered through flannel. The albumen solution is next poured into a flat dish, and the enlargement drawn over it, taking care to prevent the formation of air-bubbles; then it is dried at once. The picture, face uppermost, is now rolled up, so that it lies flat again, then it is placed once more on the albumen solution and drawn over, in an opposite direction, when it is again dried at once. Finally the print is treated with alcohol to coagulate the albumen.

Etching on Boxwood Blocks.—From a recent number of the *Photographisches Archiv* we learn that in Russia a simple and effective method of producing etchings on boxwood blocks for wood engraving has been invented. The pores of the block are first filled with insoluble carbonate of copper, by means of two separate solutions, in which it is boiled sufficiently. The surface of the block is then polished, and asphaltum in solution applied to its back and sides. Finally the polished face is coated with a film of bichromate gelatine. The block is now exposed under a negative, and the unaffected and soluble parts of the bichromated gelatine are removed by washing. The raised parts are next coated with an asphaltum solution, the block immersed in a strong solution of nitric acid, where it remains about an hour, when it is removed and subjected to the action of sulphuric acid for the same period. The parts unprotected are thus changed to nitro-cellulose, which, by brushing, is readily removed in the form of a greenish powder. Finally, the block is dried, and briskly brushed with a stiff brush. Then the asphaltum is dissolved and removed by benzine, and the block is ready for being printed. I have not yet tried the process, and I can therefore make no statements as to the practical value, but I think it an innovation that may prove worthy of attention.

New Orthochromatic Collodion Emulsion Process.—I have just received an important communication from Dr. F. Mallmann and Ch. Scolik, of Vienna, concerning this new process of obtaining a sensitive orthochromatic collodion emulsion. The beautiful orthochromatic photographs which are taken in the establishment of Dr. E. Albert (a son of the late Joseph Albert, of Munich) are admired by all who have seen them, and it is generally known in this country that Dr. Albert takes all his pictures with collodion emulsion. But his process is a secret one. The excellent results attained by Dr. Albert, and also by Baron A. von Hubl with collodion emulsion, caused Dr. Mallmann and Scolik to take up their experiments, which they had made for more than two years, which, however, after much insuccess, had been abandoned. Supposing that in order to obtain an emulsion of total sensitiveness, as well as of colour sensitiveness, it would be the best to prepare it with silver in excess, experiments were made at first in this direction. A satisfactory result being, however, not attainable, they experimented next with emulsions with bromide in excess. By these experiments Dr. Mallmann and Scolik stated (1) that the collodio-bromide, prepared with bromide in excess, shows the same tendency to assume orthochromatic qualities as the collodio-bromide prepared with silver salt in excess; if for colouring the emulsion, not the plain colouring matter (eosin) is used, but the combination of it with silver; and (2) that the silver bromide precipitated from ammoniacal solution and bromide in excess shows the tendency to colour-sensitiveness just as perfectly as the silver bromide prepared with silver in excess without ammonia. To this influence of the ammonia over the degree of colour-sensitiveness there is, moreover, an analogy in the case of gelatino-bromide of silver. If, for instance, a gelatine plate is dipped in an eosin solution, the sensitiveness for yellow will be increased; if, however, to this solution ammonia is added, then with the total sensitiveness also the relative sensitiveness for yellow will be increased in a much higher degree. I will now describe the process of preparing the collodion emulsion with which Dr. Mallman and Scolik attained most excellent results. A.—3·5 grammes of ammonium bromide are dissolved in the quantity of water which is just required, then 40 c.c. of hot alcohol are added, and next 40 cc. of plain collodion (4 per cent.) The solution is kept in a vessel containing hot water also during emulsifying. B.—5 grammes of silver nitrate are dissolved in 6 to 7 c.c. of water, then 50 c.c. of hot alcohol are added, and alcoholic ammonia (absolute alcohol saturated with ammonia gas) dropped in, until the deposit, which is formed in the beginning, is redissolved. The solution is next warmed, and 40 c.c. of plain collodion (4 per cent.) are added. In adding the plain collodion a small quantity of the silver salt is often precipitated, which, however, causes no mischief at all. A and B are then mixed in pouring A into B with much shaking. The result will be a creamy emulsion of the finest grain. After emulsifying, assure yourself that there is an excess of bromide. The emulsion is allowed to stand two to three hours, when it is precipitated in the usual manner, dried, and dissolved in such a quantity of alcohol-ether that, after it is poured on, and allowed to run down at a perpendicular position of the plate, the flame of a dark room lantern will be still visible through the film. It is impossible to make exact statements, as the proportion of the alcohol-ether varies with the quality of the cotton. To colour the emulsion, alcoholic eosin silver solution is used, which is prepared in the following manner :—One gramme of eosine (yellow shade) is dissolved in water and precipitated with silver nitrate to excess, then washed by decantation until the washing water has acquired a dark red colour; finally add diluted eosine solution to convert all the silver nitrate which might possibly be present into eosin-silver, then filter. When the precipitate is on the filter wash out twice with water, and then with alcohol to remove the water as much as possible; the filtrate will in time discolour less and less. The eosine silver is next (on the filter) dissolved with alcohol, to which is added some alcoholic ammonia and the filtrate is poured back on to the filter until the former has attained a dark red colour. Of this alcoholic eosine silver solution such a quantity is added to the emulsion that the latter is rendered intensely rose-coloured, when it will be ready for coating. In this form the emulsion proceeds with ripening, and will improve in sensitiveness. As to the limits of the latter, further experiments will convey information. Previously may be stated that an emulsion which was kept for eight days still worked excellently. Glass plates provided with a substratum are to be avoided; it is better to use plates which have been roughed round the edges with an emery file. The coated plates have been always used at once without drying. For developing the pyro ammonium carbonate developer as it has been recommended for collodion dry plates, may be used—

Ammonium carbonate (saturated) ...	20 c.c.
Pyro solution (alcohol 1 : 10)... ...	2 to 3 c.c.
Potassium bromide (1 : 10)	1 to 6 drops

The authors state that three to five drops of the potassium bromide solution proved to be sufficient to obtain brilliant and clear negatives. The orthochromatic action of this collodion emulsion is quite an extraordinary one; indeed, we know no process giving similar results, except that of Dr. Albert and Baron Von Hübl. In photographing the colour-table without using a yellow screen, on a dull winter day, the colours acted as follows: —Chrome-yellow, stronger than ultramarine; chrome-orange, like ultramarine; chrome yellow, like cobalt-blue. In using a light yellow screen, vermilion acted stronger than ultramarine. As to the total sensitiveness of the emulsion, it proved to be about the same as that of wet collodion plates. Considering, however, the fact that a gelatine plate of medium sensitiveness, to attain the equal orthochromatic action, requires the use of a dark yellow screen, the difference in exposure will certainly be not great. The above described collodion emulsion will chiefly prove to be of high importance and usefulness for those photographers who have to reproduce paintings and other coloured objects; but also to the landscape photographer it will be useful as soon as the well deserving investigators by their continued experiments will have succeeded in producing with this emulsion dry plates which will keep.

Notes.

The case of Downes and Fallowfield clearly shows the necessity for some tribunal where law can be combined with science. Probably Mr. Justice Grove, who is a scientific man, would have revelled in the photographic technicalities the fringe of which was just touched by the fragment of evidence given last week; but it looked as if Mr. Justice Manisty did not relish the ordeal which was in store. As for the counsel, Mr. Finlay, who represented the defendant, seemed most uncomfortable during his cross-examination of the plaintiff, and must have heartily welcomed the collapse of the case. There was a good deal in the hearing, so far as it went, which to a photographer was extremely funny. Mr. Justice Manisty's vein of dry humour came in now and again with excellent effect. At the outset, after marking half a score of sample photographs with the letters of the alphabet, so as to distinguish them, he seemed to divine the formidable nature of the case, and asked to be spared the threatened avalanche of specimens. The Counsel made merry over the photographs of the wedding party, the lady with the small-pox, and the leper. The jury added their quota to the general enjoyment by remarking, when asked by the judge if they had got the wedding party, "Yes, we have the bride," whereupon Mr. Greene, plaintiff's counsel, observed jocularly, "Now you shall see the mother-in-law," while the usher was in a broad grin the whole time he was handing the photographs about.

But this was only the preliminary skirmish. When the serious part of the business came on, everybody, except Mr. Downes, who was giving evidence, speedily got out of his depth. It was delightful to see Mr. Finlay gravely hand up a gelatino-bromide print to the plaintiff and ask him whether he did not find spots in it similar to the spots in the inculpated prints. As if the spots on gelatino-bromide paper were at all analogous to those on albumenised paper! But it was all one to Mr. Finlay, and, quite unconscious that he was talking nonsense, he went on to ask the plaintiff, in the tone which is intended to confuse and frighten a witness: "Do you suggest that the spots in this photograph (*i. e.*, the gelatino-bromide print) are due to the bromide having been used?" What answer could a photographer return to such a question? Unintentionally, Mr. Downes gave the best answer possible. He entered into some chemical explanation where Mr. Finlay could not follow him, and all the counsel could do was to repeat his question about the bromide as though it were a very vital point.

The cream of the fun, however, was when the plaintiff, in reply to Mr. Finlay, said he detected three kinds of spots in a certain print handed up for examination. The counsel did his best not to show his dismay, by directing the witness to put circles in pencil round these particular white spots; but when Mr. Downes went on to describe another kind of white spot which had a black spot in the centre, he fairly rebelled. The white spot with the black centre was too much for him, and he at first warmly protested, but possibly thinking that he might have to state why he objected to this particular variety of spot, he finally admitted it. Almost every question led to some answer the key to which was not in the counsel's brief, and it was not at all surprising, when Mr. Justice Manisty interrupted in his quiet way and mildly remarked that to proceed further was "hopeless," that a sigh of relief went round the court. The odd part of the matter is that to the photographer the point at issue is a very simple one.

An article in the *Bulletin de l'Association Belge de Photographie* has some very sensible remarks on the construction and arrangement of the studio. The studio, we are told, ought to have a gay aspect, and to present the appearance of one's home. It ought not to be loaded up with furniture and apparatus, and should be cool in summer and warm in winter. The writer is further of opinion that the success of a portrait depends upon the effect of the photographer and of his studio upon the model. Every photographer will agree with this, but when the writer goes on to say that the studio should have the effect of an inhabited room furnished with the moderation suitable to what the model observes at home, we are landed in an embarrassment. How is a photographer to know what kind of home his sitter has? He can only guage the status of his sitter by the price he charges, though this rule is not infallible, as poor people have been known to save up their money in order to go to a high-priced man, while wealthy persons have patronised the photographer whose charges are low.

The writer gets over the difficulty by steering a middle course. He recommends the photographer to avoid meanness on one hand, and on the other, ostentation. There must not be too great a display, even if everything be in good taste. The effect produced upon the visitor should be that everything is natural. It is impossible to conceal the various objects connected with photography, nor is it necessary to conceal them; but what is to be found fault with is the disorder and discomfort of many studios. The writer prefers to have the centre of the studio free except for the camera, and perhaps a table or a chair. The rest of the furniture and the properties should be arranged round the walls ready to be employed when necessary. A studio of a gay appearance has a great influence upon many people. There are persons who are put in a bad humour if they look into a melancholy space, and it is sufficiently tiresome to find oneself in an apartment which is not familiar, and to submit to a strange operation, without having the misery of being photographed amid comfortless surroundings. All this is very true, and it is a poor consolation to know that there are careless and untidy photographers on the Continent as well as in England.

Vereschagin, it is said, intends to make some "realistic" sketches of East-end London life. If so, it is to be hoped that he will succeed better than Gustave Doré, whose attempts were simply absurd. It is very curious that the three French artists who tried to draw English lower class life—namely, Gavarni, Doré, and Montbard—have never succeeded in doing anything which at all approached the truth. It is hard to believe that the artists' trained eye could not see, or that the trained hand failed to delineate what the eye saw, but, judging from results, one or the other seems to have failed miserably. One is almost inclined to think that to draw scenes and characters of this kind with absolute accuracy, and, what is more important, to be able to put in local colouring and touches of Nature, one must not only be of the same nationality, but must have a much more intimate knowledge of their habits and characteristics than a week or two's study will give. The best course the foreign artist can pursue is to faithfully and laboriously reproduce instantaneous photographs if he wants to avoid making an English mob a foreign one, which otherwise he will most certainly, though unconsciously, do.

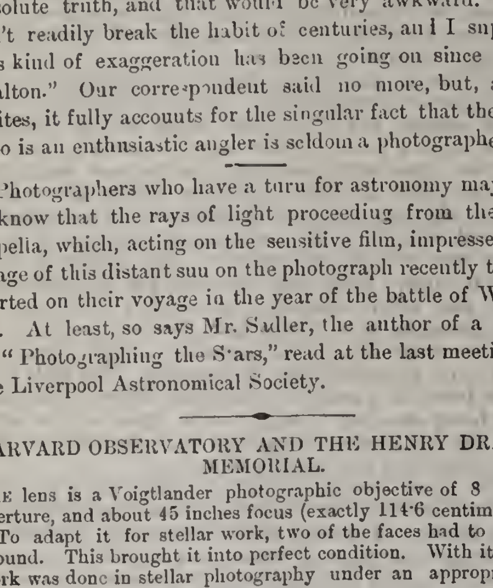
The enterprising photographer, anxious to keep pace with the times, has to be constantly adding, as we have more than once explained, to what may be called his studio "properties," and the latest addition he has had to make has been a special constable's staff! For, strange as it may sound, the evidence is increasing in favour of the assertion we made last week, that with many of the "Specials" the first thought after obtaining an armlet and a baton, is to be photographed wearing the one and grasping the other. But granting this to be the chief desideratum, it is not strange that it has already occurred to many not over-scrupulous fellow-citizens of ours, that it is a desideratum which can be easily secured without going through the somewhat "tedious and troublesome preliminary operations of getting sworn in and called out," and all the rest of it. Sheridan, it will be remembered, once rallied his son who had just returned to the surface of the earth in a dusty, grimy, and generally-uncomfortable condition, from the bottom of a coal pit, with his folly in having undertaken such an expedition. "But at all events," returned the young man, when his father had done roasting him, "at all events, sir, I shall now have the satisfaction of being able to say that I have been down into a coal mine." "As if," retorted his cynical, and we fear we must add, unveracious parent, "you could not have said that just as well without having first troubled yourself to really descend one!" Well, if current rumours be correct, there are not a few of our fellow-citizens worldly wise and disingenuous enough to be acted on by the suggestion made by Sheridan; and hence, as we have said, the advisability of adding a special constable's staff (the more "imposing" in size and appearance the better, in every sense of the word) at once to their photographic accessories.

At the last meeting of the Athenæum Angling Society, when a paper was read by J. C. Harding on "Art in Relation to Angling," there were several lamentations over the fact that, as a rule, artists failed miserably when they attempted to paint fish. The beautiful sheen of the scales apparent when the fish is taken out of the water is never rendered by the artist, and for a very good reason: he generally paints the fish some time after it is dead, and after its peculiar lustre has vanished. A photographic correspondent who was present at the meeting suggested privately to a member that anglers should take up photography; not that a photograph would give any idea of the lovely tints of the fish, but that it would be interesting to have a memento of the fish directly it was caught. "Yes," said the member, dubiously, "but there is a little difficulty in the way. You see, we anglers are apt to put on a pound or two to the weight of our fish. We don't do it purposely, but somehow it comes natural. Now if we photograph the fish, it would compel us to stick to the absolute truth, and that would be very awkward. You can't readily break the habit of centuries, and I suppose this kind of exaggeration has been going on since Isaak Walton." Our correspondent said no more, but, as he writes, it fully accounts for the singular fact that the man who is an enthusiastic angler is seldom a photographer.

Photographers who have a turn for astronomy may like to know that the rays of light proceeding from the star Capella, which, acting on the sensitive film, impressed the image of this distant sun on the photograph recently taken, started on their voyage in the year of the battle of Waterloo. At least, so says Mr. Sadler, the author of a paper on "Photographing the Stars," read at the last meeting of the Liverpool Astronomical Society.

HARVARD OBSERVATORY AND THE HENRY DRAPER MEMORIAL.

The lens is a Voigtlander photographic objective of 8 inches aperture, and about 45 inches focus (exactly 114·6 centimetres). To adapt it for stellar work, two of the faces had to be reground. This brought it into perfect condition. With it much work was done in stellar photography under an appropriation from the Bache fund of the National Academy of Sciences, awarded in 1885. It is now devoted to photography of spectra. In front of the objective a battery of two prisms is carried. At the other end of the plate a sensitive plate occupies the position of the focus. By this extremely simple method, first suggested by Fraunhofer, the spectra of numerous stars are obtained upon a single plate.



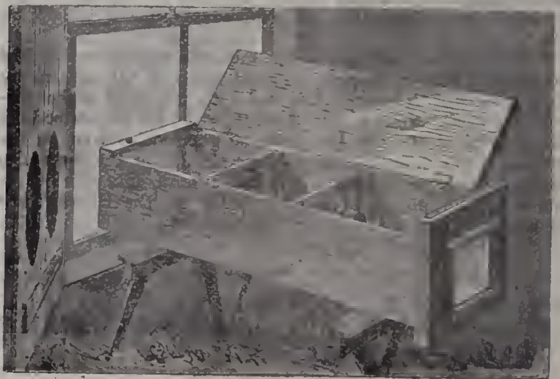
Huyghenian Motion.

For driving it the Huyghenian motion is used. The peculiarity of this system is that it can be re-wound without affecting the running of the apparatus. The wheel furnished with a ratchet wheel and pawl is the winding axle. When this is turned, the large driving weight is raised and the small weight descends. But during the winding the driving wheel, the one to the extreme right is continually urged to rotate, just as when the winding ceases. The driving weight never ceases to exert its pull upon this wheel, which represents the drum of the ordinary gravity train.

The original work done by this telescope was purely photographic. Under the Bache appropriation, the investigation took the direction of stellar photography. Under the Draper Memorial Fund, the work of stellar spectroscopy was taken up. The work is now carried on in the following manner.

The prisms are set with their edges horizontal, so that the spectra are vertical. By five or six trials the adjustment for focus is secured, and this lasts for an indefinite period. If now a photographic dry plate is exposed while the instrument rotates by sidereal time, the spectra of all the stars in the field will fall upon the sensitive plate. However long exposed the plate was, assuming all to be in accurate adjustment, the spectra will appear as very fine lines. Their width in general terms is equal to the diameter of the images that would be photographed were the prisms removed and the telescope directed upon them. The largest of the stars would give only a thread-like line to represent its spectrum. The width of this has to be increased for the spectrum to be visible. While this might be done by magnifying the image, a very ingenious application of the principle of "trailing" is used to partially effect the desired result. If the telescope were kept immovable, the stars by the rotation of the earth would sweep across the field of the instrument. This motion with the prisms in place would affect the spectra in the same way. They would be widened into bands. Except in the case of stars near the poles, the motion of the stars across the field would be far too rapid to sufficiently affect the sensitive film, were the telescope kept motionless. Hence, in practice it is rotated, but at a rate slightly less than the angular motion of the earth. This slowly widens the spectra, but allows them to act for a long enough time upon the plates to produce a good actinic effect. The exposures under present practice are in the neighbourhood of one hour's duration. In this way, instead of narrow, line-like spectra, bands a sixteenth of an inch wide or more are produced. In a subsequent issue we will show how these spectra thus produced appear.

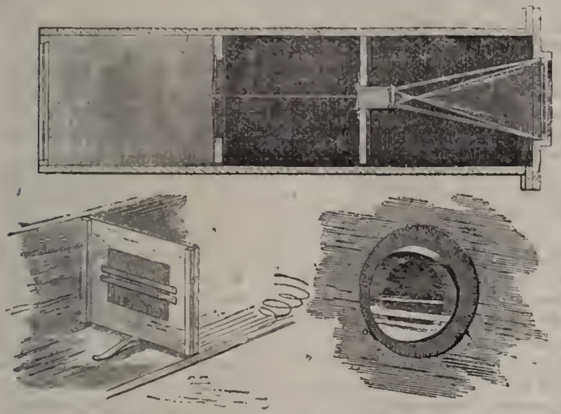
The relative action of the different parts of the apparatus is now clear. The light from the stars strikes the faces of the prisms, and passes through them. The pencil of light from each star is thus refracted, and produces a spectrum with vertical axis and horizontal lines. This falls upon the photographic objective, and is brought thereby to a focus at the lower end of the tube. There it is received upon the sensitive plate, while the telescope by its motion, slightly slower than that of the earth, draws the image out so as to increase its horizontal dimensions and amplify the breadth of the spectrum.



Enlarging Apparatus.

* Continued from page 746.

After a sufficient exposure, the plate is taken from the telescope to the dark room, and is developed. From the negative thus produced a greatly enlarged positive is produced by the use of the apparatus shown in the cut. The negative is set on edge in a box with ground glass, and by two brass strips and dark paper it is completely covered, except the narrow area containing the spectrum. Next to this a concave cylindrical lens is placed. Owing, it may be, to irregularities in the motion of the telescope, or to changes in the transparency of the air, the spectra always contain a number of longitudinal streaks. The cylindrical lens, by its dispersive effect, destroys this imperfection. A photographic lens receives the light transmitted through the negative and cylindrical lens, and brings the image to a focus where the image falls upon a sensitive plate. The horizontal streaking is not the only defect of the original spectra. Owing, probably, to variations in the refractive power of the atmosphere, the lines or bars are not perpendicular to the axis of the spectrum. The cylindrical lens is mounted so as to be susceptible of rotation. It is for each spectrum so turned that its axis shall be perpendicular to the inclination of the bars.



Section of Enlarging Apparatus, with Cylindrical Lens.

The general process is the familiar one of photographic enlargement. Its most characteristic feature is the use of the cylindrical lens and of the metal strips and screen. Great care has to be exercised in this part of the operation to keep the edges of the metal strips clean. Little particles of dust might otherwise appear on the magnified image as spectral lines.

The plate, after due exposure, which is executed by daylight, is developed, and gives a spectrum that may be several inches wide and proportionately long. The bars still appear as crossing it at an angle. To produce a straight spectrum, a portion is marked out, giving the lines at right angles to the axis. Thus the faint light of the stars is reinforced by the daylight, which produces the enlargement, and which acts like a telegraphic relay.

Such is a brief summary of the methods as now used. The work is still in development. A great many of the spectra are photographed with a large glass and with prisms of higher dispersive power. Neither can the full scope be understood, or the progress of the last few years be grasped, without an inspection of the different final photographs and of the successive stages in their production. This and other points will be reserved as the subject of another article on the Harvard observatory.

(*To be continued.*)

HOW TO MAKE LANTERN SDIDES ON GELATINO-BROMIDE AND GELATINO-CHLORIDE PLATES.

BY I. H. JENNINGS.*

XI.—Defects, Failures, etc.

It may be as well to notice a few of the more common defects and failures met with by the beginner in his first essays at making lantern slides; for photographic operations are often perfectly bewildering to the novice, and it frequently happens that after having followed the instructions for exposing, developing, &c., as he thinks without error, he is puzzled by annoying defects in his work, or even complete failure. A photographic friend is not always at hand to point out the cause of failure, so the beginner is compelled either to blunder on in the dark, or write to some photographic journal and ask the editor's advice. Still, there are some who do not like to expose their ignorance by asking elementary questions, or who do not think it right to worry editors by asking questions that, to an expert, must often appear foolish from their very simplicity. It will not be possible here to do more than to notice a few common defects and causes of failure, although some of them have been incidentally touched upon in previous chapters.

1. *Thinness of Image.*—A lantern positive ought to be much thinner than a window transparency; but, if *too* thin, it will appear a mere ghost on the screen. It is far better, for ordinary lanterns, to have a slide too thin than too dense, as, by modifying the light, a thin slide *may* be made passable, while an over-dense one will obstruct too much light to show any detail.

A thin image may arise either from over-exposure, or from imperfect development. If under-developed, the slide is useless; but if the thin image be the result of over-exposure, a tolerable slide may be secured by intensifying the plate with mercuric chloride and ammonia. Soak the plate in water until the film is thoroughly softened, and then place it in an alum bath for ten minutes. Now wash well for a few minutes, and immerse it in a bath of mercuric chloride solution until whitened completely through. Next wash well, and put the plate into a clean dish filled with water to which a few drops of strong ammonia have been added. Leave it in this bath until the whole image has assumed a dark tint, and all traces of whiteness have disappeared. The slide will now be found of a more or less warm brown tone, and, before being stood up to dry, must be again well washed under the tap, passing the fingers over the whole of the film to clear away any possible deposit.

2. *Too Great Density.*—This fault is not likely to occur if the iron developer be employed, unless development be carried too far. Too great density may easily be obtained with the pyro developer given in Chapter VII. if the pyrogallic acid be used in excess, or development be unnecessarily prolonged. As a rule, it is best with this developer to start with *less* than one grain of pyro to each ounce of solution, and attain proper density gradually.

It is better, by judicious development, to *avoid* rather than *cure* over-density in lantern slides; but, as at times errors will occur, it is well to know how to save slides that are too dense. One method is to take the slide from the fixing bath, and stand it up to dry *without* washing. As soon as the plate is dry, it is washed for an hour or two, then placed in an alum bath, again washed, and stood up to dry. This plan answers if the slide be only slightly over-dense; but if the density be great, it is best to use the following excellent and effective reducing bath introduced by Mr. Howard Farmer:—

Ferricyanide of potassium ...	1 ounce
Water	1 pint

Prepare a hyposulphite bath—1 ounce hypo to a pint of water; pour sufficient of this in a tray to cover the plate, and add a few drops of the ferricyanide solution. In this bath immerse the dense plate, and watch it, taking it out occasionally to mark the progress of the reduction, and, when thin enough, wash thoroughly for half-an-hour in running water and stand up to dry. Before putting the slide in the above solution, it should be well soaked in water to ensure a uniform action all over the film.

Care must be taken, when adding the ferricyanide to the hypo solution, to mix the two well before putting in the plate, or patchy marks may result. The mixture of hyposulphite and ferricyanide will not keep, but must be poured down the sink when done with. *Pure* ferricyanide of potassium should be purchased, as much that is sold at ordinary chemists' shops is very dirty, and in other respects unfit for the purpose.

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* Continued from page 678.

3. *Uneven Density.*—Sometimes a slide will be much denser on one side than the other, thus spoiling it for lantern use. This arises, perhaps, *only* in slides prepared by copying, and is the result of unequal illumination, the book or negative copied from being lit up more on one side than the other. It is hardly worth while to doctor up such slides if a fresh negative can be made; but the unequal density *may* be modified by a careful use of Farmer's reducing solution with a stiffish camel's-hair brush; but, unless skilfully done, the slide is only made worse than ever. Such defects are best avoided by allowing the illustration copied from to receive a uniform diffused light from the front; *side* illumination is a fertile source of unevenly dense negatives and positives.

4. *Fog.*—This may have several causes. The light of the dark room may be unsafe, or white light may gain access to the room through crevices, or through an ill-fitting blind. Sometimes, placing lantern plates in the hypo bath without properly washing off the iron developer will cause a nasty dark fog, which is past all cure. The developer should be well rinsed off, and the plate be immersed for several minutes in an alum bath before placing in the fixing solution. Any carelessness in this respect will give defective slides. Over-exposed plates will often look foggy, and if the apparent fog arise from this cause only, intensifying will often improve matters. Fog may also arise from trying to force out the details in an under-exposed plate by using an excess of alkali. It is useless trying to do anything with under-exposed plates, whether negatives or positives, for if the plate has not received sufficient light to produce detail, no strengthening of the developer can create it where it does not exist.

5. *Granular Deposit.*—A granular deposit may be caused by placing the plate direct from the alum bath into the fixing solution without washing, when a deposit of sulphur will be thrown down on the film, and, at times, be hard to remove. Granular deposits are, however, usually caused either by a precipitate from a badly made ferrous-oxalate developer, or by one of oxalate of lime from the hard water used. In either case treating with acid alum cures the evil, the film being also well rubbed with the fingers.

6. *Yellow Stain.*—This is one of the drawbacks of the pyrogallic acid developer if badly made, or if the development be too prolonged. The same stain, but in a far worse form, will occur if false economy be practised by trying to develop several slides successively in the same pyro solution. The developer soon becomes of a dark brown colour, and stains the plate so badly, that severe treatment with acid alum for several hours is the only cure. Fresh developer should be made up for every plate, and the plate must be really *well* washed before placing in the alum bath; first rinse the plate several times, and then let it soak for several minutes. Any slight yellowness left in the film will be removed by the final bath of acid alum. If slides have been dried before the yellow stain be perceived, they must be soaked in rain water for half-an-hour, and then left in a bath of acid alum for twenty-four hours.

Still, yellow stain is so easily avoided by clean and neat manipulation, that its occurrence, unless with the beginner's first experiments, is hardly to be excused.

7. *Opalescent Film.*—Opalescence is often seen in slides developed with ferrous oxalate, and is usually caused by employing hard water for the solutions instead of rain water. It is not a serious defect, but can easily be removed by acid alum, and by rubbing the film with the fingers under the tap. All plates, after treatment with alum, should be well soaked to remove the alum, which otherwise would crystallize out on the film, and spoil the plate.

8. *Unsharpness of the Image.*—This may be due to several causes, such as the following:—(*a*) Bad focussing. This can arise only from pure carelessness, although one amateur *did* confess to the writer that he (the amateur) did not always know when an object *was* in good focus. He actually said, "How do you know when an object *is* in focus?" No doubt focussing demands the greatest care, especially in copying negatives or book illustrations, and first using a large stop for focussing, and then inserting a small one before exposure, will do much to secure the desired sharpness. (*b*) A bad lens. Some of the cheap so-called "rectilinears" sold are quite useless for copying, having a very curved field; and, in some, the "chemical and visual foci" do not coincide. There is no cure for this defect, unless to get rid of the lens and purchase another. (*c*) The image may be unsharp because the book illustration or picture copied may not be quite flat, or from want of parallelism between the copy and the sensitive plate. To get an engraving or book illustration perfectly flat is not always an easy matter; but, unless it can be done, it is worse than useless to attempt to copy it. If the page copied be wrinkled and uneven, parts of the negative and positive will be in focus, and others hazy and indistinct.

(*d*) Movement of the camera after focussing will also cause an unsharp image. Unless the camera be firmly screwed down to the baseboard, movement from the proper position is very likely to happen when inserting the dark slide, especially with a light camera. Sometimes a worn or too easy rack adjustment will cause motion of the camera by slipping on the least pressure. Such matters may appear trivial to some, but unless they be attended to, good results cannot follow; and it must be remembered that these chapters are not written for the expert, perhaps equipped with the most perfect apparatus, to whom the performance of all photographic operations has become second nature, but for the amateur beginner, with a slender stock of appliances, and a much more slender stock of practical knowledge and experience.

(*e*) The plate may shift in the printing frame during exposure by contact, and thus create an unsharp picture. This only occurs if the back of the frame fits badly, and is apt to slide from the pressure of the springs. Some printing frames that answer very well when used for printing on albumenized paper placed over a negative, are very unsatisfactory when they have to contain two thicknesses of glass. Such frames should be discarded.

Frilling, especially in hot weather, is a source of annoyance with some makes of plates. If the plates used are found to have a tendency to frill, they may be coated before development with enamel collodion, and when the collodion has set, be placed in a dish of water for a few minutes until the "greasy" appearance has disappeared. If this be thought too troublesome, immersing the exposed plates in a tray of methylated spirits will often cure the frilling tendency.

Such defects as spots, marks, stains, &c., caused by dirty fingers or dirty dishes, hardly call for mention, unless to warn the amateur that no one who is unable to keep his fingers and his apparatus clean can hope for clean slides. Clean manipulation is of the highest importance in every department of photography, but negatives will often stand slovenly treatment that would ruin a lantern positive; and the amateur who has accustomed himself to the production of yellow, dirty negatives must turn over a new leaf before he can manufacture even a tolerable lantern slide.

In closing these elementary chapters on making lantern slides on gelatine plates, the writer hopes they will answer the purpose for which they have been written, not only by dissipating what unfounded prejudice still exists against lantern slides on gelatine, and especially gelatino-bromide, plates, but also by inducing many a one to take up the manufacture of lantern slides, either for the purpose of entertainment or instruction. Lantern exhibitions are deservedly popular, and the amateur who is able to make his own slides may, at slight trouble and expense, frequently contribute to the amusement of his friends and neighbours in the winter evenings—too often dull for lack of occupation--by giving a lantern exhibition either illustrating a holiday trip, or some scientific subject treated in a popular manner; and he will find no difficulty, whether he dwell in some quiet country village, or in the busy town where rival attractions abound, of securing an appreciative and delighted audience.

Patent Intelligence.

Applications for Letters Patent.

15,018. John Edward Thornton, 3, New Lorne Street, Moss Side, Manchester, for "Flexible films for photographic and other purposes, and apparatus in connection with the manufacture thereof."—22nd November, 1887.

16,059. Jean Baptiste Germeuil-Bonnaud, 54, Fleet Street, London, E.C., for "Improvements in connection with photographic printing."—22nd November, 1887.

16,131. Carl Heinrich Hamman, 45, Southampton Buildings, London, for "Improved means for securing the leaves in photographic albums and the like."—23rd November, 1887.

16,136. Edwin Jennings Ball, 39, Aynhoe Road, Hammersmith, W., Middlesex, for "The application of photography to automatic sale and delivery machines, and the utilization of automatic sale and delivery machinery for the production, sale, and delivery of photographs."—23rd November, 1887.

16,212. Joel Cadbury and William Henry Richards, 6, Livery Street, Birmingham, for "Improvements in frames or stands for holding photographic and other pictures, tablets, and the like."—25th November, 1887.

16,241. Felix Joseph Vergara, 35, Southampton Buildings, Chancery Lane, London, W.C., for "Improvements in apparatus for coating glass or other surfaces with fluid or semi-fluid substances for photographic or other purposes."—25th November, 1887.

Patent which has become Void through Non-payment of the Fourth Year's Renewal Fee.

3948, of 1883. J. J. Sachs. (*Fickeissen and another.*) "Photographic plates, &c."

Official Abstracts of Accepted Complete Specifications.

Marriott, 12,292, 1887. "Developing, fixing, washing, and retouching." Washing: prints placed in upper compartment of vessel communicating by inclined passages with lower compartment containing water wheel.

Moss and Milton, 1830, 1887. "Miscellaneous." Roller bearings for rolling presses.

Specifications Published.

5,488. Harry Whitfield, 68, Broad Street, Birmingham, for "Improvements in holders, clips, or easels for photographs, mirrors, photograph frames, cards, and other articles."—Dated April 15th, 1887.

The Patentee says:—My invention is primarily a metal holder or clip, constructed to hold or clip a glass plate, behind which is held a photograph, picture, or card. It is also constructed to hold or clip a mirror, photograph, card, or other article.

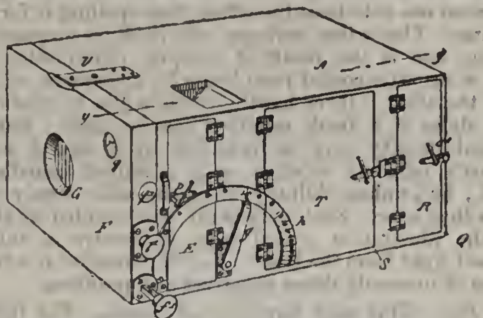
My invention is formed of two flat or round strips of metal, or other suitable material. These two strips are riveted or in some other way fastened together loosely at their centres so as to form a cross. Each end of each strip is formed as a hook. A spring which exerts an outward pressure is attached, one end of it to each of the two strips, at a position above or below the centre of each strip. On this spring being compressed, the cross assumes a lengthened shape, and when the spring is released, the cross is shortened, and clips the article which it is required to hold. Thus, when it is desired to release the article held, it is only necessary to compress the spring, and the cross lengthening looses the hooks from the article held.

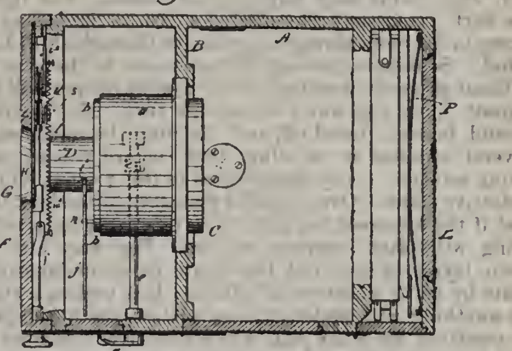
I make the spring in my invention in such a way that it can be used as an easel leg, but any suitably formed spring would actuate the cross in my invention in the manner desired.

Patents Granted in America.

372,856. William H. Lewis, New York, N.Y., assignor to E. and H. T. Anthony and Company, same place, for "Photographic camera."—Filed Oct. 29th, 1885. Serial No. 181,299. (No model.)

Claim.—1. In a photographic camera, the combination with the camera-tube and focussing device connected therewith, of a graduated scale and an indicator for adjusting the focus of the tube to the distance separating the camera and the object to be photographed, substantially as herein specified.





2. In a photographic camera, the combination with the lens-tube and rack-and-pinion for focussing the same, of an arbor extending through the side of the camera-box, provided with an indicator-arm, and a curved graduated scale formed on or secured to the exterior of the camera-box, substantially as herein shown and described.

3. In a photographic camera, the combination with the slotted tube D of the diaphragm-plate *j*, having formed on the ends thereof diaphragms *l l′*, and provided with apertures *o*, and the stationary pin *n*, arranged to be received in the apertures *o* of the diaphragm-plate, substantially as herein shown and described.

4. In a photographic camera, the shutter-disk H, provided with a bevelled lug *r′*, and bevelled buffers *t′* and *s′* for arresting the motion of the shutter-disc, substantially as herein specified.

5. In a photographic camera, the combination with the spring-actuated apertured shutter-disc H, provided with the pulley *u* and with the bevel-lug *r′*, of the yielding bevelled buffers *t′ s′*, supported in the path of the lug *r′*, the sliding replacing-rod *j*, extending through the side of the camera-box, the cord *g′*, connected with the pulley *t* and attached to the inner end of the rod *j″*, and means, substantially as herein shown and described, for retaining and releasing the shutter.

6. In a photographic camera, the combination with the apertured shutter-disc H, of the pulleys *t u*, of different diameters and attached thereto, the spring-acted lever *y*, the rod *d′*, the cord *w*, attached to the lever and to the pulley *u*, the cord *g′*, the sheave *h′*, pull-rod *j′*, secured to the cord *g′* and extending through the camera-box, the retractile spring *m′*, connected to the rod *j′* and arranged to return it to the point of starting, and means for retaining and releasing the apertured shutter-disc, substantially as herein shown and described.

7. The combination, with the cover F, having the aperture G, of the apertured and notched shutter disc H, the pulleys *t u*, secured thereto, the spring-acted lever *y*, the cord *w*, secured to the lever *v* and pulley *u*, the cord *g′*, secured to the pulley *t*, the spring-pressed pawl *o*, and the rod *q′*, substantially as herein specified.

8. In a photographic camera, the combination of the shutter-disc H, having a notch *n′*, and provided with a bevelled lug *r′*, of the spring-acted lever *v*, the cord *w*, the cord *g′*, the spring-acted pawl *o′* and rod *q′* and the bevelled buffer-springs, *t′ s′*, substantially as herein shown and described.

9. In a photographic camera, the combination, with the finder lens r, secured in and carried by the cover F, and removable chamber J, placed in the camera-box, of the ground glass u', placed in the said chamber J parallel with the plane of the lens, and a mirror y' placed behind the ground glass u' in the chamber J, substantially as shown and described.

10. The combination, with the camera-box having grooves M for receiving the plate-holder and the ground glass frame, of a frame, P, having spring-bowed sides, and placed in the grooves M of the camera-box for holding the plate-holder and the ground glass frame, substantially as herein shown and described.

11. The combination, with a camera-box provided with a fixed finder-lens, of a removable finder-chamber, the finder-lens being located outside of the finder-chamber, substantially as specified.

Correspondence.

ORTHOCHROMATIC PHOTOGRAPHY.

Dear Sir,—May I trespass on your space to reply to the letter from Messrs. B. J. Edwards and Co., in your issue of Nov. 25th? In the first place, I beg to thank them for their offer of emulsion, &c., and hope to avail myself of it later on. There is, however, no question of "resuming" my experiments, since they have never been discontinued, and it may interest your readers to know that I have received a grant from the Research Fund of the Chemical Society in aid of the investigations.

And now as to the specification, the wording of which, according to Messrs. Edwards and Co., I have "curiously misread or misinterpreted." I am acquainted with only one specification relating to eosine in photography, and this is No. 101, 1883. No other eosine patent is to be found in the indexes of subject matter since that date. This specification I quoted almost *in extenso* in my article (p. 708), but with your permission I will reproduce two paragraphs which I copy from the official specification as it lies before me:—

"According to the present invention the gelatino-bromide process of photography is carried out by two different methods, according as it is desired to prepare the gelatino-bromide, or to use plates already prepared. In the former case eosine, by preference previously dissolved in ammonia, is poured into the emulsion of gelatino-bromide of silver at the moment of its formation. The proportion of eosine employed is about one part by weight to one hundred parts of the compound. The eosinised emulsion is spread as usual over the glass plate, and after exposure to the light is treated in the usual manner for the development and fixing of the picture.

"When gelatino-bromide plates already prepared are available, it is sufficient to pour over the dry film the ammoniacal solution of eosine, to which alcohol is added. The plate is then washed without fear of the removal of the eosine, which becomes immediately associated with the gelatino-bromide."

These are the only working directions in the specification. I leave others to judge whether the invention is described "so fully and clearly that anyone having a competent knowledge of the subject can work it without difficulty." Observe that the quantity of dye to be used in the bath process is left entirely to the discretion of the operator, without any indication that success depends mainly on the use of the proper proportion, and with no hint beyond the one per cent. in the first paragraph. There is no mention of any necessity for a special kind of eosine.

Messrs. Edwards and Co.'s opinion that my paper is incomplete entirely coincides with mine, though our reasons probably are somewhat different. Surely there is nothing "singular" about the want of completeness? It is scarcely possible to exhaust a subject like orthochromatic photography in twelve months, especially when one's time is pretty fully occupied with other matters; and when an investigator takes up a scientific problem, he does not usually concern himself at the outset with any particular commercial product connected with the question. As a matter of fact, however, a comparison of the various commercial orthochromatic plates does form, and always has formed, part of my scheme of investigation. "All things come round to him who can but wait."—I am, yours faithfully, C. H. Bothamley.

The Yorkshire College, Leeds.

WHAT IS AN AMATEUR?

An Apology to W. H. Hyslop.

Dear Sir,—I desire to tender my unreserved apologies to Mr. Hyslop for my letter published in the Photographic News of 21st ulto., relative to his photographs of the *Thistle*, as the statements or insinuations made therein imputing dishonourable conduct to Mr. Hyslop are, I find, without the slightest foundation in fact.—Yours truly, A. J. West.

Southsea, November 25th, 1887.

STRIPPING FILMS PATENT.

Dear Sir,—*Re* Mr. Foxlee's Patent for Improvements in, or relating to the treatment of Photo Dry Plates or Films, published in your Journal of November 4th, page 698.

We have received the accompanying letter from our correspondent in America, where the Lambert processes are worked to a considerable extent:—

My Dear Mr. Bird,—It is with astonishment I read in the *British Journal* for November 4th, 1887, pages 699-700, and the Photographic News same date, page 698, the details of a Patent allowed Edward William Foxlee, Acton, Middlesex, on what he terms "Improvements in, or relating to the treatment of Photo-Dry Plates or Films." I should be pleased to hear from you on the subject, and wish you would inform me wherein the process he describes differs in the least from the mode of using the Contretype Tissue, as furnished by your firm in 1876. The talc, collodion, &c., were sold by Messrs. Anthony in the summer of 1876, with all the transfer papers, covered with soluble gelatine, &c., and demonstrated by Leon Lambert. As far as his claims are concerned, negatives were made by wet plate process years before dry gelatino-bromide plates were introduced, coated both sides with collodion. Gelatino-bromide stripping plates have been made for years in this country, where the glass was French chalked, collodionized, emulsionized, &c., and afterwards exposed, developed, fixed, washed, and varnished and stripped for the purpose of producing reversed negatives. Knowing all this, as it would seem that any intelligent party ought to at this day, wherein lies the novelty or invention of Mr. Foxlee in his Patent?

We feel sure that not only our correspondent, but your readers generally, will be glad to hear from Mr. Foxlee the grounds upon which he bases his claims.—We remain, yours most obediently, The Autotype Company.

November 28th, 1887.

Proceedings of Societies.

London and Provincial Photographic Association.

The usual weekly meeting was held on Thursday, the 24th ult., W. Cobb presiding.

J. B. B. Wellington, referring to scum marks on sensitive films, handed to the Chairman some gelatino-bromide plates that he stated had been coated by a friend of his who was much troubled with markings of this kind. The markings on the plate were plainly seen by reflected light. Several samples of gelatine had been tried without effecting a cure; he had himself noticed that if, during coating, he touched a bubble on the plate with his finger to disperse it, a scum-like marking was sure to be the result when the plate was dry.

The Chairman suggested using less alcohol.

Mr. Wellington said that in some instances no spirit of any kind had been used. Although not of much consequence in landscape pictures, these markings were a drawback to portrait work, as they were visible in the finished print.

It was thought by several members that rocking the plate too quickly while coating was the cause.

A. P. Higgins said he had made a contrivance for supplying water for development purposes, which he exhibited. It consisted of two pieces of glass tubing put through a cork, which was inserted into the neck of an ordinary water-bottle. He said he had not a proper dark room, and he found a bottle fitted in this way much more handy than using a jug.

W. England, replying to a question as to the best combination for use in lantern projection, said, from actual experience, he could recommend one of Dallmeyer's portrait lenses for this purpose.

The following question from the box was read:—"Is there any rule for determining distance between lamp and condenser in a lantern for enlarging purposes? And at what distance should a five-inch double condenser stand from a four-wick paraffin lamp?" It depended entirely on the focus of the front lens, was the answer given.

The subject of developers for transparencies being under discussion, J. J. Briginshaw said he could recommend the ordinary soda developer. It was easily made, was very cheap, and was well suited for amateurs who only had occasion to develop plates now and then, as it needed but one bottle for solution, and kept indefinitely. He was able to get any degree of density with it. His experience had been chiefly with a brand of plates sold for micrographic purposes. The formula was published last year in one of the journals:—

Ordinary washing soda	4 ounces
Bromide of potassium	32 grains
Water	40 ounces

Add 1 gr. dry pyro to each ounce of solution just previous to developing.

This being a lantern night, the remainder of the evening was devoted to the projection of tranparencies on the screen.

Slides were contributed by W. England, H. M. Hastings, C. H. Cooke, J. H. A. Wellington, and A. L. Atkinson.

W. Few was elected a member of the Association.

Camera Club.

The subject on November 24th was "Enlarging," opened by a paper read by D. P. Rodgers, E. Ferrero in the chair. There was an unusually large attendance of members and friends, over seventy being present.

The screens and walls of the Club were hung with enlargements to illustrate the subject of the evening.

In his paper Mr. Rodgers treated chiefly on enlarging by means of a lantern from quarter-plate to whole-plate size, and described his method for obtaining the best illumination. In going over the advantages of enlarging, he held that the detail in a quarter-plate was too fine to be visible, but that all this detail was seen in the enlargement. Further, lenses of short focus—the smaller lenses—gave more intense pictures and greater depth than were obtained in large direct work. He preferred the lime-light as an illuminator, as he found it give more vigorous tones.

Valentine Blanchard then described his method of making enlarged paper negatives.

Mr. Hepworth pointed out that the mixed gases gave a sharper image than the blow-through, because of the larger flame of the safety-jet.

The discussion was carried on until a late hour by Messrs. Bolden, Walker, Davison, Foulerton, Adcock, Sage, Conrad, Beck, and the Chairman.

On Thursday, December 8th, Mr. Andrew Pringle will read a paper on "Amateurs' Residues." Meeting at 8 p.m.

The Yorkshire College Photographic Club.

The second meeting of the session was held in the College on Thursday, November 24th, when C. H. Bothamley, F.I.C., F.C.S., delivered his Presidential address. He reviewed the progress of the past year with special reference to orthochromatic processes, the permanence of prints, and Carey Lea's researches. A concise summary of the present artistic and industrial position of photography was then given, and the address concluded with a discussion of the claims of photography to rank as a fine art. There was a very good attendance, the address was illustrated by a large collection of specimens, including Tolley's "On the Lonely Shore," Sutcliffe's later "Studies," Hollyer's portrait of Miss Terry, platinotypes by Keene, photogravures by Annan and Swan and the Berlin Photographic Company, collotypes by Wagner and Co. and Waterlow and Sons, block prints by Waterlow and Sons, and typo-gravure by Boussod Valadon and Co.

The next meeting on Tuesday, December 13th, will be devoted to a discussion on "Methods of Enlarging."

Birmingham Photographic Society.

The annual meeting was held in the Technical Schools, Bridge Street, Birmingham, on November 24th, Dr. R. H. Norris in the chair.

C. Mantell and A. Robinson were elected members, and W. Griffiths, W. Thomas Horton, and B. Norris were nominated for election.

The Hon. Secretary read letters from A. Constantine, offering two silver and three bronze medals for next year's competition, with the proviso that one silver medal should be given for carbon prints; from E. Underwood, offering a prize for best set of three pictures of (picturesque) Birmingham, taken within three miles of Stephenson Place; also presenting a book ("The Silver Sunbeam") to the library; from E. Osborn, A. A. Nock, and E. Underwood, promising papers for next session on "Photographic Helps," "Wet Collodion Transparencies," and "Photographic Optics" respectively.

After an address by the President, the Secretary read the reports, from which the following is gathered:—

In submitting the third annual report of this Society, the Council have much gratification, inasmuch as that both in work done and in additional membership, the Society had made most satisfactory progress. Deducting resignations and those struck off the roll for non-payment of subscriptions, the register shows a total number of members and associates of 144 against 108 last year. The average attendance at 17 meetings had been 49, a decided improvement on former years. A summary of papers read and special exhibits during the year was then given, followed by an account of the October exhibition and of the excursions, all of which have been duly recorded in these columns. The Council recommended that the Exhibition for 1888 be held towards the close of the year, and announced that they had already received several offers of prizes for competition, namely, one of the value of a guinea each from John Collier, A. A. Bonehill, E. H. Jacques, F. Hoskins, and A. R. Longmore; A. Constantine, two silver and three bronze medals; and W. Tylar, an enlargement for the best street scene.

The Librarian reported, that owing to the limited funds in the hands of the librarian, no ambitious attempt could be made to form a complete collection of photographic literature; but a considerable number of new books had been added during the past year, which cover a wide range of photographic subjects.

A summary of the income and expenditure of the Society was appended to the report, and showed a balance in hand of £18 0s. 2d., as compared with £12 5s. 6d. last year.

After a long discussion and passing of new rules and alterations, the election of officers and council was proceeded with, and the result was as follows:—

President—R. H. Norris, M.D.

Vice-Presidents—W. Septimus Harding, J.P., J. C. Huxley, M.D., and E. H. Jacques.

Hon. Treasurer—Thomas Taylor.

Librarian—S. J. Holliday.

Hon. Secretaries—J. H. Pickard and Wm. Rooke.

Council—J. J. Button, J. P. Heaton, E. C. Middleton, W. B. Osborn, J. Place, G. A. Thomason, W. D. Welford, and G. M. Iliff.

In consequence of the lateness of the hour the President postponed his address to next meeting.

Society of Amateur Photographers of New York.

The regular meeting held on the 8th inst. (election night) was attended by a few members. The President announced the election of H. A. Groesbeck, Otto H. Bacher, Charles L. Jones, Charles T. Harbeck, Tracy Dows, Dr. Ernest F. Tucker, S. B. Pomeroy, G. J. Edwards, James Stillman, Major George Shorkley, James H. Stebbins, Jr., Frank S. Rollins, and R. D. Douglass as active members, and H. A. Waldron, of Newburgh, N.Y., as a corresponding member of the Society, and that the next lantern exhibition would be held on the 23rd, at which it was expected Mr. George Allen would exhibit Alaska and California views, made by himself, and informally explain them. After a few further remarks he introduced Mr. D. Cooper, who explained informally his method of working bromide paper, and concluded by giving a successful and interesting demonstration. He made two enlargements, one of group of two girls, and one of the Natural Bridge of Virginia. The latter negative was 4 by 5 in size, and was enlarged to 17 by 14. It being over-dense in certain portions, Mr. Cooper first exposed the whole for two minutes, then he intercepted the light with a cardboard, having a hole in it about two and one-half inches in diameter. He then let the light pass through the card on the dense portion of the picture—that is, the white part—and moved the card gradually to and from the lens. This was kept up for about half a minute, then the exposure was stopped. As a result, the shadows were not over-exposed, while the light portions, which otherwise would have been without detail, showed it fully, and developed out as rapidly as the shadows. It should be mentioned that a kerosene light of peculiar construction was used, being placed behind the camera, while the negative was located between the two and behind a condenser, or when the latter was not used, in front of the ground glass. The lens on the front of the camera was adjustable to or from the negative. The whole affair was very simple, light, and compact.

At the conclusion of the demonstration, Mr. Cooper exhibited several mammoth bromide enlargements, life-sized, representing difficult subjects as to light and shade.

DAVOS AND ST. MORITZ PHOTOGRAPHIC SOCIETY.

This Society has been established mainly by the English residents, and the following Memorandum is published in the *St. Moritz Post and Davos News.*

The object of this society is to bring to bear the influence of Art upon Photography.

Rules and Regulations.

1. Amateur or professional photographers are eligible for membership.

2. An annual fee of three francs shall be paid by each member.

3. The affairs of the society shall be managed by a joint committee of six members (3 for Davos and 3 for St. Moritz), including a secretary for each place, who shall be elected annually as soon after the 1st Nov. as may be found convenient. The committee shall have the power of filling any vacancy that may occur among its members in the course of the year.

4. A list of subjects for periodical illustration, together with the dates of contribution, shall be issued by the committee as soon as possible after the 1st November.

5. Every member is required to contribute at least one photograph on each occasion.

6. Any member failing to comply with Rule 5 will be fined one franc.

7. All contributions must be original work, and must not have been previously exhibited in the portfolio of the society, but the committee shall have power at their discretion to limit the competition to work done during the season.

8. No signature or other distinguishing mark must appear on the work, but the member's name must be sent to the local secretary with each contribution, which must not exceed the size of the portfolio (17 by 13 inches).

9. The portfolio will be circulated among the members in succession, the last member who receives it returning it to the local secretary. Each member is requested to write below his name on the list accompanying the portfolio, the date of receipt and despatch. Any member retaining the portfolio for more than one day will be fined ½ franc.

10. Every member may give three votes, to be divided between the two best photographs. No member is compelled to vote, or to give the maximum number of votes. Votes are to be recorded by writing the voter's initials on the voting paper against the number corresponding with the contributions selected.

11. At the close of the season a prize will be awarded to the member who has received the highest number of votes.

12. A paper will be circulated with the portfolio, to contain bonâ fide criticisms, suggestions, or queries, which must be authenticated by the member's name.

13. Any three members wishing to propose an alteration of the rules must give written notice thereof to the secretary, who will call a special general meeting to consider the same, when the proposal can only be carried by a three-fourths majority.

The Secretary is Arthur Herbert, Villa Creslattce, Davos Platz, Switzerland.

Talk in the Studio.

North London Photographic Society.—The next meeting will take place on Tuesday, December 6th, when T. Charters-White will lecture on "Photo-Micrography."

To Correspondents.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

⁂ We cannot undertake to return rejected communications.

France.—Perhaps you can obtain them from Marion & Co., 22, Soho Square, or at Mrs. Evans' photograph shop in Duncannon Street, Charing Cross.

Lady Saltoun.—You cannot do better than go to Lawley, of 78, Farringdon Street, or Hunter and Sands, of 20, Cranbourne Street.

C. H. Evans.—1. Yes, lead answers very well indeed. 2. If, by your direct or implied instructions, you ordered them to be sent by post, they are at your risk, unless, indeed, you can prove definite carelessness as to the mode of packing.

Chapman Jones.—We are sorry that it is again so this week, but there is no help for it. Thank you for the reminder.

H. S.—Thanks very much. We are glad to be able to give the information this week.

G. Davison.—1. Thank you for the reminder. 2. We are glad to hear that they have consented.

D. Winstanley.—1. We cannot judge on such slight information, but if it has so many points of excellence, your way will be to patent it if you wish to secure monetary profit.

E. Dixon.—Thank you for the further particulars. We hope the police of the town in question will investigate the matter, and take action should the affair be the result of intentional fraud.

E. Dunmore.—We are glad to have the tickets, and will try and do as you suggest.

C. J. B. W.—The testing has not yet come off, and we do not know whether the results will be made public. Your want of "a plate which will give a shutter picture on these dull days, say with *f*-14," is one which others feel as well as you.

W. P. Kennan.—We hope to have the block made by next week; and we are very pleased that you have taken such a view of the case.

W. G. Lewis.—The article is evidently founded on the statements of the Company, and the print you send seems to be work of a similar character to that offered by the Company. We are obliged to you for the trouble you have taken, and return the specimen.

Solar Radiance.—1. At the sale office for patent publications in Cursitor Street, Chancery Lane. 2. Your only chance is to advertise for it—say in the *Exchange and Mart*—or to hunt patiently through the second-hand bookshops. 3. There is no patent covering the production of all prints with platinum as a basis. We shall be glad of details as to your method. 4. The original version of lectures, if in print, can be had at the house of the Society of Arts, John Street, Adelphi; but we do not know whether the Scientific Publishing Company has reprinted them. 5. Ten or twelve shillings would, we think, be enough to give for the lot. Complete sets often fetch a high price, but the odd volumes seldom realise much.

⁂ Several answers are unavoidably postponed.

The Photographic News.

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For Advertisement Scale see page v.

Advertisements should be forwarded (prepaid) to Piper and Carter 5, Furnival Street, Holborn, E.C., to reach the office not later than noon on Thursday. A fee of 6d. must be forwarded when the Publishers are expected to receive and forward replies to Advertisements; and when they undertake the receipt of replies, they must be entrusted with the name and address of advertiser, for revelation to applicants, in case they may deem it necessary.

THE PHOTOGRAPHIC NEWS.

Vol. XXXI. No. 1527.—*December* 9, 1887.

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FRAUDULENTLY OBTAINING SPECIMENS.

The thief who operates by violently expropriating an owner is now so far behind the age that he seldom prospers; indeed, he is generally poor, and carries about him the visible signs of working at a decidedly unremunerative profession; while his more progressive brother who moves with the spirit of the age, and expropriates others according to legal methods, may live in a fine house, and, like Bret Harte's bad boy who did not repent, may be universally respected.

The thief whom we know that we can immediately hand over to the policeman is easily dealt with; but those practitioners who have not the courage of the footpad, and who, notwithstanding this, aim to obtain, without working, some part of the fruit of the labour of others, are, we are sorry to say, found in photographic circles. Indeed, we frequently hear of those who call themselves photographers, and induce the public to pay them money on the strength of good work which they show—this good work being obtained sometimes by purchase, but more often by stealing of various degrees of villany.

A very usual thing is to advertise in the Photographic News and other papers for an assistant, and when the correspondence is opened, to say that specimens must be sent, and that the specimens will be returned at once; then to keep the specimens for exhibition as own work, and to take no notice of the repeated applications of the victim for the return of the specimens.

Of course it must be understood that occasionally—indeed, frequently—photographers of high standing, and having the most honest intentions, ask applicants for situations, to send specimens; hence an assistant who refuses to send his work, and to send it promptly, may lose the opportunity of getting a situation: so his case is really difficult. He should, however, never send specimens to an advertiser who wishes to cover himself by receiving the specimens under initials; and, moreover, if the assistant has an opportunity of referring to the list of photographers in Kelly's directory of chemists and druggists (1885 edition), he should do so. Indeed, one may assume that if a man has been in business in the same place since 1884, the probability of his being a regular stealer of specimens is not very great; for your thief by mean tricks is a very shifting individual.

When specimens are not returned according to promise, the victim should go to the police-station nearest his residence and state the facts of the case, when the inspector on duty will give him information as to the police-station nearest the residence of the advertiser. A communication in the clearest and most concise language should then be addressed to the inspector on duty at that station, which, for convenience, we will call the advertiser's station, with a request that he obtain what information he can regarding the matter. Sometimes, in such a case, the inspector at the victim's police-station will himself write the communication to the advertiser's police station. Generally speaking, when a police-officer calls on a specimen stealer to make enquiries, that individual says that he has just returned the specimens by post, and, as soon as the police-officer has gone, he really posts them. To a certain extent, this is satisfactory; but it would be more satisfactory still if the delinquents could be brought to justice.

Unfortunately, those robbed by the specimen stealer are generally poor in this world's goods, and not in a position to sustain the great expense which would be entailed by a prosecution. We imagine that if it were proved that a photographer had obtained from an assistant a specimen of his work, and then exhibited that specimen in his show case, a charge of theft could be sustained: but who is to pay the heavy expense of such a prosecution? Perhaps one day the Photographers' Benevolent Association, or some kindred body, will be strong enough to do such work.

THE LONDON STEREOSCOPIC COMPANY'S PHOTOMETER FOR USE IN THE FIELD.

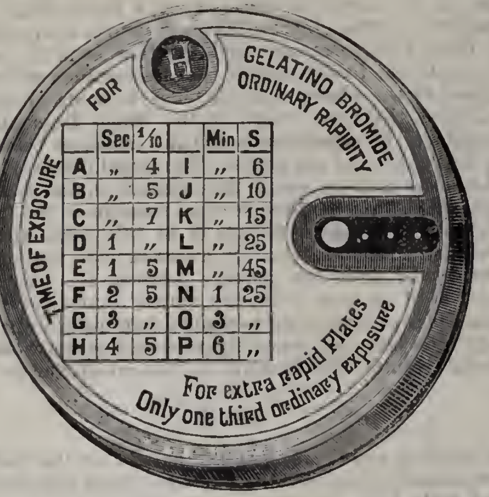
From the Stereoscopic Company we receive for review a photometer on the screen principle, and in which the observer has to recognise a point at which the light ceases to very sensibly affect his eye.

The arrangement of the instrument is very clever and ingenious, and we have not met with any apparatus of the class which pleases us so much as that now before us.

The block shows the actual area of the photometer, and it is about half-an-inch thick. Virtually, it is a brass box with a revolving disc inside it, and this carries a series of increasingly opaque windows which are brought in succession under the long opening shown at the East side of the diagram, each of the windows corresponding to a letter which becomes visible at the round opening shown near the north of the sketch (see next page).

The method of using the photometer is as follows.

Having focussed the picture and inserted the diaphragm, place the photometer against the ground-glass with the most transparent series of windows over the half tones of the picture, viz., over such parts as are neither very strong in high lights nor in dense shadow; now, with the head still covered by the focussing cloth, carefully turn the centre button from left to right, keeping the eye about 18 inches away from the aperture, when it will be found that the light admitted through the three small holes at the side of the larger one will become gradually less until they become almost undiscernible, but leaving the larger aperture still visible.



	Sec	1/10		Min	S
A	„	4	I	„	6
B	„	5	J	„	10
C	„	7	K	„	15
D	1	„	L	„	25
E	1	5	M	„	45
F	2	5	N	1	25
G	3	„	O	3	„
H	4	5	P	6	„

When this is attained, remove the instrument and ascertain the letter visible in the circular aperture at the back; the necessary exposure will at once be found opposite the corresponding letter on the table. For example: If the light transmitted be indicated by the letter O, the required exposure will be three minutes; if I be visible, six seconds. On the table given, the left-hand column represents seconds and tenths of a second; the right-hand column is given for minutes and parts of a minute.

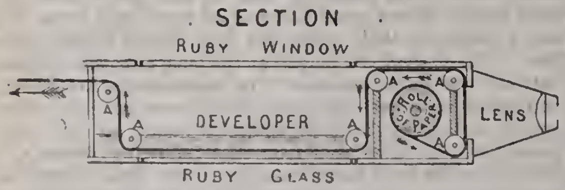
The exposures tabulated on the photometer are for plates of average rapidity, a somewhat vague expression, but still giving some notion of what is meant; indeed, all will understand that a photometer such as now described can only give an approximation, but nevertheless may be of very essential service to one not constantly at work.

◆

KENNAN'S ACTINOMETER.

I purpose for the above an apparatus in one or more parts, enabling a sensitive surface to be exposed and afterwards developed.

A small dark back measuring say about 3½in. by 1½in. by 1½in. deep, holding a number of slips of the brand of plate in use by the photographer; in front of this back there would be a slide carrying a small lens having stops of any standard aperture; this would slide up and down in front of one of the sensitized plates, so that, say, three exposures could be made on a slip measuring 3¼in. by 1$\frac{1}{16}$in. (a ¼ plate cut in four). A small bath (either made of ruby or yellow glass, or with a piece let in to serve as a window) would be slid, or otherwise placed, so as to receive the exposed slip, and this bath would contain a developer, say a standard oxalic developer. The effect of the different exposures could be watched whilst developing, and, of course, the proper exposure would be at once determined on. The developer could be carried either in the little bath, using a vulcanized cover, or in a vulcanized ball.



The above apparatus could be easily made very light and portable; but I suggest the advisability of using negative paper in place of glass; this could be used, say one inch wide, rolled up, and would be made to pass behind the small lens, thence, after exposure, into a trough or bath containing the developer, and from that to the outside of the apparatus, where it could be examined. The latter apparatus could be made to measure only 4in. long by 1in. square, as per rough sketch.

◆

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.*

Chapter XV.—Lenses (*continued*)—Other Lenses—Steinheil's Antiplanatic Lenses — Methods of determining Focal Lengths by Experiment and by Calculation—The Optical Centre—The Points of Admission and Emission.

Other portrait lenses than those already mentioned have been introduced from time to time with more or less success.

In 1874, Steinheil describes a portrait lens that has both its combinations cemented, and the inner surfaces of both of nearly equal curvature, as shown in figure 32. In 1878, Voigtländer made lenses in which the ordinary back combination of the Petzval lens was replaced by a cemented combination so constructed that both combinations had outside surfaces of equal curvature. Each combination was of the same focal length, which was two-thirds of the focal length of the whole lens. The general form of the instrument is given in figure 33. The maker claimed for it that it avoided distortion of the image, and that it was more rapid in action and gave more depth of focus than the original Petzval. However, in spite of this impossible combination of improvements, this construction was soon abandoned.

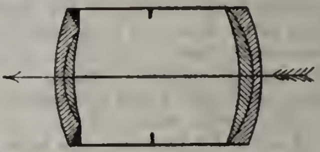


Figure 32.

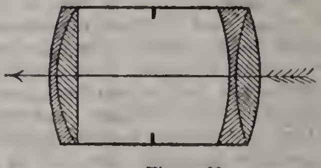


Figure 33.

The greatest departure from the rules ordinarily observed by opticians in devising photographic lenses has been made by H. A. Steinheil in his "antiplanatic" lenses for portraiture and views which were introduced in 1881. These are shown in figures 34 and 35. In both cases the anterior combination has a shorter focal length than the whole lens, and the posterior combination is diverging. The back and front combinations both suffer greatly from spherical and chromatic aberrations, but to an equal extent in an opposite sense, so that they form a properly corrected whole. It is

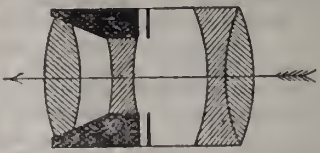


Figure 34.

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* Continued from page 629.

claimed by the inventor that by means of this principle a better definition is secured at the edges of the field. The maximum aperture of the portrait lens is $f/$, and of the view lens $f/8$. In cases where so great a thickness of glass is employed, the colour of the glass is a far more important item than with ordinary lenses, and it should be noticed that the yellow tinge of flint glass of great specific gravity generally increases as the specific gravity increases.

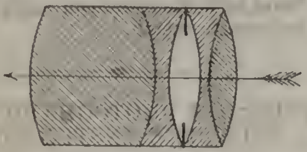

Figure 35.

A photographic objective, like every other instrument, requires skill in the using of it; and speaking generally, the better or the larger the lens is, the more need is there for skill and care. In ignorant and untrained hands, an inferior lens will often give a better result than a more perfect objective, and the amount of carelessness that will do no appreciable harm when using a slow landscape lens and a small plate, would be fatal to the results on a larger plate or with a rapid lens. It is especially for this reason that beginners are advised to practise at first with small cameras and comparatively slow lenses.

To use lenses intelligently and successfully, the operator must be acquainted with certain of their properties. The focal length of a lens for parallel rays is an item involved in the majority of problems. This can be determined roughly, but near enough in most cases to identify the lens from the maker's catalogue, by focussing a distant object and measuring the distance between the ground glass and the back surface of the lens if the lens is a single combination, or between the ground glass and the diaphragm if it is a doublet.

But by taking advantage of the fact that the focal lengths of lenses are proportional to the linear dimensions of the images that they give, it is easy to formulate a method that is exact and convenient, especially when several lenses have to be tested. For this purpose it is required to have a lens of known focal length, or a thin spectacle lens will serve as the standard, because being thin it is easy to measure the distance between it and the screen, upon which it produces a sharp image of distant objects. The spectacle lens used must not be a meniscus, and to be most exact it should be plano-convex, with the convex side towards the screen, when the distance between the convex side of the lens and the focussing screen is the focal length of the lens. To use such a standard lens, the distance between the sharply focussed images of two objects that are far enough away to be in focus at the same time that the horizon is sharply represented, is determined, and the distance between the same images is measured, using each of the lenses to be tested in its turn. The proportions that exist between these distances are also the proportions that exist between the focal lengths sought.

An equally exact, though practically more awkward method, is to mark the positions of two sharply focussed images on the ground glass, and then to substitute a piece of tin foil, or a card with a small hole in it, for the lens (or perhaps the smallest diaphragm of the lens itself will answer if the combinations are removed), and to get the two images produced by the simple hole to exactly correspond with those produced by the lens. The distance between the small hole and the ground glass is the focal length sought.

If a sheet of printed matter, or its equivalent, is sharply focussed under such conditions that its image is exactly the same size as the original, the distance between the ground glass and the printed sheet will be four times the focal length sought. This method gives a result near enough for most practical purposes, but the figure so found is rarely more than an approximation to the real focal length. The reason of this will be apparent when we come to consider the optical centres, &c., of lenses. A theoretically correct figure is obtained by focussing as above, and then noting the distance that the ground glass has to be moved forward to get a sharp image of the horizon, or some object so far away as to be equivalent to it.

When two lenses are used together, as in the ordinary doublets, the focal length of the combination can be determined by the above methods; but it is also possible to calculate the focal length of the whole from the focal lengths of its constituents, and the distances between the optical centres of the lenses. The actual distance between the lenses is of no use in the calculation, and it becomes important to note this, because sometimes the "separation" of the lenses is spoken of in this connection without further explanation. In a certain wide angle doublet, the writer finds the distance between the lens to be a quarter of an inch, while the optical centres of the components are more than two and a-half inches apart. To calculate with the lesser figure would give a worse than useless result. The formula for this calculation is

$$f=\frac{a \times b}{a + b - s}$$

in which a and b are the focal lengths of the two lenses respectively, s the distance between their optical centres, and f the focal length of the combination. Putting the formula into words, the product of multiplying the focal lengths of the two lenses together is to be divided by the sum of the focal lengths added together minus the distance between their optical centres.

It follows from the above that the focal length of one of the lenses can be calculated if the focal length of the other, the focal length of the whole combination and the separation, are known. Using the symbols in the same sense as above

$$a=\frac{f(b-s)}{b-f}$$

But perhaps the problem in this connection that most often presents itself in practical photography is to find the focal length of one constituent of a symmetrical doublet. It is a common statement by makers, that either lens of such a combination can be used alone as a single view lens, its focal length being "about double that of the complete lens." This is the roughest approximation, often an inch or more in error in the smallest lenses. The following pairs of figures give first the equivalent focal lengths in inches of the complete lens, and then that of the back constituent. The first and third are wide angle lenses, the second and fourth rapid lenses:—4·4, 7·8; 5·8, 10·4; 7·8, 14·2; 12·9, 22·7. It is a nearer approximation to say that such lenses as are generally used for small plates have the focal length of one constituent equal to an inch or an inch and a half less than twice the focal length of the entire lens But if the focal length of the lens, and the distance between the optical centres of its components are known, and assuming that the components are of equal focal length, as they ought to be, the focal length of one component can be calculated from the following formula, in which a is the focal length sought, f the focal length of the entire lens, and s the separation of the constituents:—

$$a = f + \sqrt{f(f-s)}$$

Or in words, by subtracting the separation of the constituents from the focal length, multiplying this figure by the focal length, taking the square root of the figure so obtained, and adding this to the focal length, we find the focal length of one constituent of a symmetrical doublet lens.

Every lens or combination of lenses has an optical centre, and one of the chief properties of this point is that rays of light passing through it are not deflected, but pursue paths parallel to their original paths. It is often stated that the optical centre is the point of the lens from which must be measured the distances of object and sensitive plate in copying to exact scales, but this statement is not quite true, especially in the case of thick lenses. The optical centre is also the mechanical centre or the centre of gravity in symmetrical lenses, and it will be convenient to approach this subject by first studying a thick double convex simple lens. In fig. 36 the optical centre is indicated by a dot, and *a b*, *c d*, are rays passing through the optical centre. By continuing within the lens the direction of the rays outside the lens, as is done by the dotted lines, two points are obtained which are called respectively the points of admission and emission. It is from these points that all measurements must be taken in calculating distances for enlarging or reducing to scale. These points owe their existence to the thickness of the lens. In estimating the focal length of such a lens by taking a quarter of the distance between an object and its image produced of equal size, we get too high a result, because the distance between the points of admission and emission is not excluded.

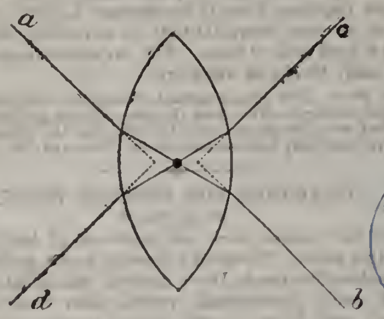

Figure 36.

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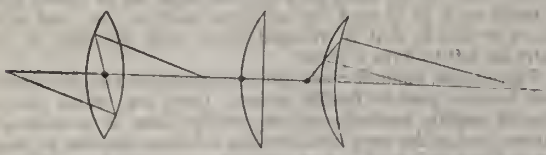

Figure 37.

The position of the optical centre of a single lens can be determined by setting out a section of it and drawing a line from the centre of curvature of each surface to its corresponding curve in such manner that the two lines are parallel. A third line is then drawn through the points where the curves are cut by the radial lines, and the optical centre is that point where this third line cuts the principal axis. In figure 37 this method is shown with a double convex lens and a meniscus. The optical centre of a plano-convex is on the curved surface; in the case of a meniscus it is outside the lens altogether. In using a single landscape lens, therefore, the distance between the back of the lens and the focussing screen is considerably greater than the equivalent focus of the lens; and as with a doublet this distance is considerably less than the equivalent focus, a given limit of camera extension may leave a margin with the latter lens, but be an inch or two too small for the former, though the focal lengths of both lenses are the same. In those cases where the optical centre is on the surface of the lens or outside it, the optical centre is identical with the point of admission or emission, as the case may be, and the position of the other point can be determined in the same way as before, as shown in figs. 38 and 39. Here *a b* and *c d* represent rays passing through the optical centre, and the dotted lines indicate the point of admission or emission that is not identical with the optical centre in each case.

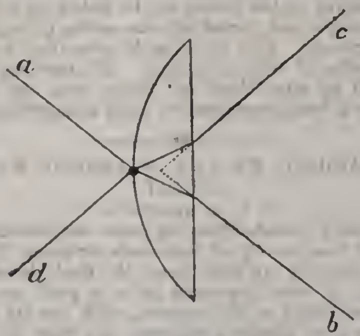

Figure 38.

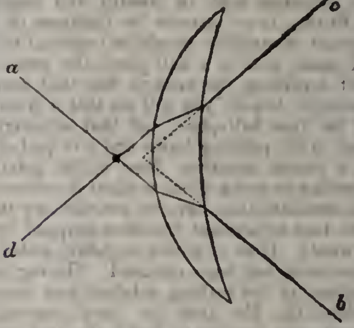

Figure 39.

The optical centre of a symmetrical doublet is its mechanical centre, and as the points of admission and emission may be nearer to the optical centre than in the case of single lenses, it is not of practical utility to pursue this subject further.

(To be continued.)

REMOVING GELATINE FILMS FROM THEIR GLASS SUPPORT, AND CONVERSION OF AN ORDINARY NEGATIVE INTO A FILM NEGATIVE.

BY W. LANG, JUN.*

I WISH to bring under your notice this evening not only a very simple method of stripping a gelatine film from its glass support, which does not seem to be so well known as perhaps it should be, but also further demonstrate the possibility of converting the ordinary gelatine negative into the film form of negative. Every one knows how tenaciously the dry plate film clings to its glass support. Quite recently a manufacturer of dry plates, who had a stock of fogged plates, and who desired to recover the emulsion, mentioned to me the difficulty he had experienced in getting the film scraped off; in fact, they were about beat with it, and, as you imagine, a scraping process, as far as the glass was concerned, was certainly not to be recommended. I suggested the use of a weak solution of hydrofluoric acid, and so effective is such a solution that I thought it might interest the members to bring it before them in a practical form this evening. Here are some old negatives varnished, and unvarnished, and I will immerse them for a short time in the solution, and you will see with what result. In a very short time you have the complete film detached, longer of necessity in the case of those negatives which have been varnished, as the solution in this case, owing to the protecting layer of varnish, does not penetrate so quickly to the glass surface. The strength of the solution is a matter of no great exactitude, perhaps ten ounces of water and half an ounce of ordinary commercial hydrofluoric acid. A stronger solution might operate quicker, but, as every one knows, the substance we are dealing with is in the strong form employed to etch glass; a weak solution, although it may take longer, would certainly be preferable where the glass might be wanted to be used over again.

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* A Communication to the Glasgow Photographic Association.

I think you will see that the glass from which the films have been removed has not been attacked in any way, and one recommendation may certainly be put forward, that after being washed they may be considered as chemically clean. I, perhaps, should mention that as the solution, even in the weak form, is a highly deleterious one, the fingers should not be immersed in the solution. In making the experiments for this night's communication I was somewhat careless regarding this matter myself, and for a couple of days afterwards I was reminded of the fact by a severe pain under each nail of the fingers which had been immersed in the liquid.

Now, having got the film off, and that in a perfect form, it has for a long time appeared to me that here we had a veritable film negative, and that only two things were wanted to make the thing complete, namely, to prevent the expansion of the film—for you will see in the films which have been removed that a considerable extension both in breadth and length has taken place—and, further, to so increase the thickness of the film that a certain amount of stability should be imparted to it. To illustrate what I mean, here is a half-plate film removed from the glass support according the method described, and allowed to dry on a vulcanite board; you will see that it is now very much larger than the true half-plate, and that although it certainly could be used in the printing frame and give perfect results, still it is rather a fragile negative. Now in the gelatine skins we have been hearing so much about to-night in connection with Mr. Armstrong's demonstration, have we not the very thing that will enable us to turn to account the films stripped by the method now put forward? Here is a film negative, and I beg now to show you how such has been obtained. Having immersad the skin for a minute in the soaking solution, and transferred it to the tray where the film that has been removed is floating, it will be found quite possible to bring the two out together i close contact. A vulcanite sheet being at hand they are placed upon it, and by means of water made to be perfectly flat. Air-bells can be driven out by gentle application of blotting paper, and when no more of these are seen the whole can be allowed to dry, when it is a very easy matter indeed to pull off the film negative. Regarding the prevention of the film's expansion, I think this may be arrived at by means of alcohol. By means of this reagent we are not complicating matters. By the introduction of a salt into the film, as we would were we employing a solution of alum with alcohol, a subsequent washing is dispensed with.

As far as my experiments go, the proper strength to use is a solution made up half of methylated spirit and half of water. Undiluted methylated spirit has far too energetic a reaction, contracting the film most unconscionably. The soaking in the spirit may be done in the same tray in which the detaching operation has been performed, the hydrofluoric solution being gently poured off. And it is as well to leave the original plate in the tray, so that when the alcohol has reduced the dimensions of the film we may readily see when it has been brought back again to its original size when on the glass. At this stage, or perhaps shortly before, the skin should be immersed in the soaking solution recommended by the Eastman Company:—

Ammonia	¼ ounce
Glycerine	¼ „
Water	64 ounces

The skin is then, as already indicated, laid down on the top of the film, and the two lifted out together. The vulcanite sheet being at hand, or, what answers as well, a ferrotype plate, the double films are placed thereon—perhaps it is the better arrangement to have the skin next the vulcanite. As the alcohol evaporates and leaves the gelatine, by means of a camel-hair brush any inequalities may be adjusted, and it will be found by a very little care that the two films will be perfectly flat and in close contact. Notwithstanding the very thin nature of the uppermost film, it can stand a good deal of pulling about. You will see that this is the case when we come to the actual demonstration.

I do not think much more remains to be said. It must be understood that I do not put forward this converting of an ordinary negative into a film negative as a perfect process, but I think you will admit that having once got the film off the glass in the very perfect manner obtainable by means of hydrofluoric acid, the possibility of still retaining that negative in the film form is not far removed. Again, take the case of a cracked negative where the film, notwithstanding the crack in the glass, still remains good, such a negative need not be thrown away, for, by following out the lines here indicated, it can be made to do duty over and over again.

For the introduction of these gelatine skins in a commercial form I think the best thanks of those interested in photography are due to the Eastman Company. I should, perhaps, just remark, before closing this communication, that the skin used for a particular size of negative should be of a size larger than the actual negative we are dealing with; for example, in the case of a whole-plate negative, I would recommend a skin 10 by 8; this enables one to have more latitude in adjusting the two films, and saves a good deal of time. The surplus margin of the skin can very easily be cut off when dry.

Editor's Note.—The Plener method of stripping the gelatino-bromide film, and associating it with a fresh thickness of plain gelatine, was originally described on p. 225 of our issue for 1882, and the advantages of this method have repeatedly been set forth in the News and Year-Book.

DRAWINGS FOR PROCESS WORK.

BY B. DAY.*

Drawings for process work are made on all kinds of Bristol board, ledger paper, Whatman's drawing paper, grained drawing papers, such as Steinbach, Day's grained, enamelled, printed and embossed cards, photographic paper, plain Saxe or Clemens leatherized, and heavy coated enamel papers, such as Day's scratch board.

The implements used for coarse work are ordinary writing pens, and for finer work, Gillot's map pens, Crowquills, No. 290 Somerville lithographic pens, and Keuffel and Esser's lithographic pens. Some of the most beautiful line work can be drawn with a brush such as is used by miniature painters, viz., red sable No. 0 or No. 1, if it is trimmed down until but eight or ten hairs are left to form a point.

There are all kinds of ready ground drawing inks in the market, but none so good as freshly ground India ink, which can be ground readily, perfectly and absolutely black, in an ordinary saucer, and is the very best working medium that can be used for pen or brush work. Any ordinary saucer will do, and for an inkstand buy a common brass thimble, to which fit a cork. Fill the thimble with water as a measure of the quantity of ink required. Pour this into your saucer and rub up your India ink until you think it sufficiently black. Then keep up the rubbing five or ten minutes longer. Now add one drop only of glycerine, and rub a little more, and the ink is made. To mount the inkstand, cut a potato or turnip in half, scoop out a hollow for the thimble, using the flat cut surface as a base for the inkstand, and when the pen fouls, jab it into the vegetable, which will clean it. To pour the ink from the saucer to the inkstand, make a long gutter of writing paper, by which it can be poured in without spilling a drop.

Lithographic crayons, No. 1 Lemercier's or Currier's, are used for drawing on the grained papers, and can be mixed with pen work thereon. By warming the back of a drawing made with lithographic crayons, they are fixed more firmly to the paper and made blacker. Drawings on enamelled board are made more readily with a brush than a pen. Solid blacks can be painted in sparingly with a camel's hair brush. Pen lines run into these solids, impinging on the blacks, can be picked up with the point of a sharp scraper and carried into the solids, giving the effect of a wood engraving. This work can be cross-lined with a brush, giving the effect of white stippling. All drawings for process work should be pure black and white, even the finest lines. Their colour is best ascertained by using a magnifying glass.

PHOTOGRAPHING BY THE FLASHING MAGNESIUM LIGHT.

BY T. N. ARMSTRONG.†

It was originally intended that my paper and demonstration to-night should treat merely of Eastman's stripping films, but at the end of last week my kind friend, Mr. Reid, threw out a suggestion which at once impressed me as a good one, viz., that, conjointly, we might on this occasion, with the aid of artificial light, expose a few Eastman strippers, and then develop, strip, and skin them in your presence. To enable us to do this, we have received at the hands of Mr. Mason much kind assistance in providing the necessary accessories to enable us to carry this into effect. I should have much preferred, had I been able, to expose a few films outside and show the development and after-treatment of such, but you are aware the weather has been so bad lately that such was not possible.

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* *Scientific American.*

† A Communication to the Glasgow Photographic Association.

Quite recently the taking of pictures by artificial light without the aid of elaborately costly accessories has received fresh impetus, chiefly through the revival of what is really not a new mode of making exposures, for so far back as November, 1865, I find that almost identically the same ingredients were then in use and recommended by Traill Taylor as we find now trotted out as quite new, and which, I understand, has been attempted to form into patents.

In November, 1865, Traill Taylor recommended a mixture of sulphide of antimony, chlorate of potash, sulphur, and magnesium filings, and, if I am not mistaken, this is practically the same compound as we hear so much made of by Dr. W. H. Vogel, who designates it "the latest novelty in Germany," attributing its discovery to Messrs. Gädicke and Miethe. This compound, after all, is not so desirable as it would at first appear, for it is undoubtedly of most explosive character, being easily exploded by friction or a blow; then, again, another objection arises, and that is the character of the fumes given off from the mixture—the sulphide of antimony when burnt gives off sulphurous gases, and also fumes of antimony oxide, the latter being poisonous. More recently it has been suggested to use, instead of sulphide of antimony, a substitute in the shape of powdered sugar; but when such is employed a very black smoke is given off, which is undesirable.

Very recently there was exhibited before the Society of Amateur Photographers of New York, by Dr. H. G. Piffard, a mixture of guncotton and magnesium powder, and much success has attended its use. I show you a picture which forms the frontispiece of *Anthony's Bulletin*, under date November 12, 1887. This is an instantaneous photograph at night by Geo. G. Rockwood, and was taken by means of Dr. Piffard's magnesium flash light. You can form your opinion, gentlemen, as to the excellence of this production.

Within the last few days my friend, Mr. Reid, and myself have been experimenting somewhat with this flash light. At first we met with some little difficulties, but to-night we hope to show you that a fairly good negative is obtainable by the use of magnesium powder being burnt in conjunction with a few inches of magnesium ribbon.

Our first experiment was with cotton and powder alone, in the proportion of eight grains of cotton to fifteen grains magnesium powder. This yielded a somewhat under-exposed plate; but it is only fair to state it was our first attempt, and it is just possible the light was placed at too great a distance from our sitter. Approaching nearer to the sitter and using a somewhat more powerful light we obtained a fully exposed negative, but with this drawback, that there was a much too even illumination of the face—there being a lack of contrast in high lights and shadows; this might easily be the result of not throwing the light on our sitter from a proper angle or height, but we found this not so easy to overcome, through having to burn the light on an iron receiver, which tends to throw a cast shadow downwards. To enable us to overcome this difficulty, we thought upon the plan of burning a few inches of magnesium ribbon for just a few seconds before igniting the cotton, and in this we partly overcame the difficulty. The ribbon can be so held as to throw a powerful light on the prominent features of the face, and so bring up contrast between high lights and shadows. To do this we had the use of a very neat little magnesium lamp, which I now show you. You will observe the old-fashioned bright metal reflector has been removed, and in its place is substituted an opal glass reflector, which gives a much softer and diffused light, just the very thing wanted. This lamp goes by clockwork, and once lighted runs on, as a rule, right merrily, giving a very certain and steady supply of ribbon. I hope it will behave itself later on, gentlemen, when we come to operate. Should it not, it will be the fault of the ribbon, not the lamp.

Notwithstanding the success which attended our experiments with gun-cotton and magnesium powder, we were forcibly struck, when using such, with the yellow nature of the light emitted from the cotton, which in part measure neutralised the very actinic light of the magnesium powder, and we were therefore convinced that gun-cotton was not the best agent to employ. Our experiments clearly demonstrated to us that in the powder alone lay all that was required, so far as the light was concerned, and it resolved itself into a question of how best to use the powder. At first I tried several other means, among which was dusting the powder through a homely pepper-box on to a sheet of gauze made red-hot over a Fletcher burner, and here I found I was on the right track in so far as the brilliant light obtained was concerned. But then we had to overcome the difficulty of the cast shadow downwards, and the trouble of placing the light sufficiently high to throw the rays about an angle of forty-five degrees. We then, luckily, tried what a bottle of this description would do, and on using same were overjoyed to find the problem settled. With this cooling bottle containing a quantity of magnesium powder and an elastic tube attached to the ingress pipe, the least puff sent out a spray of the powder, which immediately ignites on any suitable medium for combustion. On blowing a spray of the powder through an ordinary gas flame from any common burner a most brilliant flash is obtained, far and away beyond the guncotton light, and this also enables us to direct our light from a suitable angle. When experimenting with this flash light last night I found that when flashed about six feet from the sitter the light was so penetrating as to considerably over-expose the film, and so I had to place a gauze screen between the light and the sitter. This done, I obtained a nice negative, and it will be on these lines that I shall proceed to-night. Just a word about this wash bottle. It may appear to some that a considerable quantity of the magnesium powder is forced through the gas flame without ignition, and therefore a considerable loss in material; at first I was of the same opinion, but on closely observing the matter I found such was not the csae, and that one short, quick puff did really not eject more than about twelve grains of the powder. I consider the blowing through a gas flame of this powder a great stride in the right direction in the class of work we are considering to-night, especially as it solves the difficulty of being able to throw the light from any desired angle, which is easily done by a common movable gas bracket with universal joints. I am sorry we have not one of such fitted in the room to-night, but I hope to succeed without its aid.

And now, gentlemen, having given you an outline of what we consider the best flash light to use, I will be as brief as possible in referring to the strippers. Anyone reading the printed instructions for the working of Eastman films very likely will at once conclude that there is a deal more bother in the working of them than with a glass plate. At first, I must say, such was the impression I formed; but, somehow or other, when you come to work them this does not appear to be the case, and now I am so fond of these films that I shall discontinue plates for outside work in future. In my roll-holder I carry sufficient films for forty-eight exposures, and this will at once strike you as a great advantage; the weight of this roll-holder, when fully charged with a fresh spool, does not weigh so much as one of my double backs with two plates - fancy the benefit here also. Then, again, no breakage, no space occupied in storing away glass plates, with the accumulation of dust and dirt. The films go into any ordinary book, between the pages, and can be indexed up like an invoice; the development is just as easy, the washing not so tedious—half an hour being amply sufficient in running water—no varnishing. Against all these advantages, what have we to set off as extra work? The collodionising of a plate, a very simple and easy matter, the laying of the film down on same, and, after drying, placing same under the hot-water tap till the paper support peels off, then squeegee a skin on the negative, and the thing is done; the result being a negative capable of being printed upon from either side, a matter in itself of so much importance to carbon workers as to make them almost bless the day they were invented. I have found these films very uniform in quality, of a great rapidity, much the same in this respect as Paget's sixty, and for outside work can recommend them.

SPOTS, STAINS, AND FADING.

BY F. A. BRIDGE.*

Some years ago, at a country Literary and Scientific Society, one of the members promised a paper on *The Spots on the Sun.* The evening came; there was a large attendance, and the subject was evidently of deep interest.

When called upon to read the paper, the gentleman who had promised rose and said:—"Mr. Chairman and Gentlemen, we are met together this evening to endeavour to elucidate something which has for years puzzled many of our most scientific men. It is evidently a matter in which we all take a deep interest, and that is why I promised to bring forward a paper on the subject to-night." He then took a small slip of foolscap from his pocket, and read the following question :—" *What do the spots on the sun consist of, and are they permanent or transitory?*" After expressing a hope that the discussion would be of much practical value, he bowed and sat down.

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* A Communication to the London and Provincial Photographic Association.

Now, gentlemen, that is exactly the course I should liked to have taken to-night ; for my sole object in saying I would give a short paper was to re-open the discussion we began on the 17th ult. In re-introducing the subject, however, I do not propose to confine my attention to spots only—although I believe spots, and spots only, has been a subject of interest lately—but I should also like to include stain marks, fading, or, in fact, anything tending to spoil the beautiful, though much maligned, silver print—more especially after it has left our hands in a mounted condition. It is, I think, generally admitted that mounted prints are far more likely to fade than unmounted ones ; and I think we may also take it that marks which appear in *un*mounted prints usually make their appearance during the course of their preparation.

Of course there are certain spots and stains familiar to us—spots from dirt between negative and paper, stains from hypo or untoned prints, and numbers of similar evils which are due solely to carelessness. We recognise these at once, grumble at the printer, and think no more about it, knowing that a few wasted prints, and possibly a few days' delay, will end the trouble. Occasionally, however, we come across spots and stains the origin of which we are at a loss to discover. An instance of this kind occurred to me not long ago, and I much regret now having destroyed the prints. For some months, at varying intervals, a few of the prints would be marked with yellow stains, sometimes circular, sometimes comet-shaped, sometimes no particular discernible shape. The marks usually came after fixing, and while they were in the washing water ; they did not appear to have any centre, and were various sizes, from a pin's-head to a sixpence. I tried to account for them in various ways, and failed. There was no alternative but to go on as usual, and it is some time since the enemy appeared. On the last occasion. it took a very mild form, and had the appearance somewhat of mildew ; this I can show you.

To me, however, the most annoying of the "ills" to which photographic "flesh is heir," is when you have made your prints with all the care of which you are capable, mounted them accurately, finished them and sent them home, feeling, probably, a satisfaction in the result, there may be some demon in the mounting board of the existence of which you are perfectly ignorant : and while you are hugging yourself in the belief that your pictures are as permanent as they can be made—for, alas ! with all silver prints it is only a question of time and circumstances—there may be stealing over them spots and stains, to the great damage of your reputation and the great annoyance of your customers, to whom you thought you had done your duty in that state of life to which, as a photographer, you had been called.

It is sometimes difficult to tell who is the actual offender—the printer, or the maker of the mounting boards. I am of course supposing, as I said before, that every care has been taken with the prints, that they have been well-toned, thoroughly fixed and washed, and mounted with starch ; and here we must pause a minute—there is starch and starch. When good, it is the best mountant that can be used for general work ; but it is often adulterated with something—and what the *something* is I am not quite sure—which causes spots, often attributed to other causes ; and here I would recommend my brother photographers to buy the best white starch, and buy it in the packet as it comes from the manufacturers. Many oil and colourmen keep starch, chloride of lime, and several other equally useful articles in adjoining drawers, and they are not at all conservative in the way of scoops. A little chloride of lime, for instance, might be no disadvantage when the starch is to be used for laundry-work, but would scarcely be desirable when required for photographic purposes.

To resume. I am supposing the fault not to be due to the mountant, but the mounts, or something which has accidentally or ignorantly been allowed to come into contact with them. I am inclined to think that, in some instances, printers do not take sufficient care when printing in bronze. Of course, if people will use mounts so printed, he must print them ; but he need not necessarily allow the powder to be blown "all over the shop," and so spoil the mounts of those of his customers who do not wish their boards covered with particles of tin and copper.

I remember on one occasion being in the printing department of a large photographic warehouse, and taking a cabinet mount from a pile printed in bronze, passing my hand over the back, there came off enough powder certainly to do two or three more, and yet these were all cut and laying back to face ready to be packed up and sent home.

I have heard of people saying bronze powder will not cause fading, and that experiments have been made to bring about such a thing and failed ; very likely. It is very easy sometimes to fail where you most expect to succeed, and to succeed where it would be a distinct advantage to fail. An instance of this occurred with myself only to-day. About two years ago I had a lot of large pictures to print in platinum ; the weather was humid, and I was short of india-rubber cloth. It was inconvenient to get some near home, so I sent for some material such as is used for table covers. The platin prints finished, the American cloth was left in the frames, and in due course these frames were used for silver printing. Wherever this cloth touched the silver paper, and even when a piece of blotting-paper was between them, a deep brown stain was the result. Wishing to show this to-night, I attempted to bring about the same result to-day. Whether the cloth has lost that peculiar property it once possessed I cannot say, but there is the cloth, and there are the prints, and nothing whatever is the matter with them.

Now I cannot say I have had any personal experience with bronze printed mounts ; I have always looked upon them as a personal source of injury, and avoided them accordingly. My greatest annoyance (for which the printer or card maker is responsible) is in connection with enamelled mounts. That all enamelled mounts cause fading or injury I am not in a position to say ; in fact, I show you here some pictures so mounted which have been in a show-case for years, and whatever fading there is, is certainly not due to the mounts ; they were printed in 1874.

The first case I remember of spots being caused by enamelled mounts occurred in 1874-5. I had a model to photograph, and the mounts were to be white enamelled, like the pattern sent. I obtained some of the best quality cards, and having a few left after the order was completed, used them for other purposes. All the pictures mounted on these cards were covered with spots. Here is a specimen. It will be noted that the mounts have a bronze line round them. I have always, however, considered the spots due to something in the white enamel, and not to superfluous bronze powder. The next batch of enamelled cards I have to complain about caused not spots, but fading. This was in 1878. They were of a buff colour, and all the prints I can find that were mounted on these have failed considerably. That you may see this is due to the mounts, and not any alteration in my mode of working, I here show you some pictures on plain greenish mounts I was using at the same time ; all the pictures on these are as fresh as the day they were made, or nearly so. I need scarcely say that although these pictures have been done nearly ten years, it is not a pleasant thing to reflect that, at any rate, there must be 5,000 cartes bearing my name in this unsatisfactory condition, and through no fault of mine.

Now I am not sufficiently acquainted with the various substances used in the manufacture of cardboard to say what particular compound is most likely to have caused the result I have mentioned ; but no doubt many of our better-informed members may be able to throw some light on the subject. I would also say that, in common with most of us, I have, in turning over old photographs, frequently found faded photographs on film mounts. From my own experience, however, I found those that have been enamelled the most untrustworthy, and it is my intention to avoid them in future.

One more example of marks due to enamelled mounts, and I will not further occupy your time.

Here is a carte-de-visite that has been painted perhaps two years. You will notice what appears to be brush marks on the face, and that it has faded in streaks. This, of course, might be due to an acid mountant. It is not so, of that I am certain, and if you will turn it over you will see similar marks on the backs of the card ; and not only that, but even a dark mark where it has been in contact with the little brass strut produced. What is the cause of this I am unable to say ; but I hope the discussion to follow will be the means of clearing up some of these points.

In conclusion, I may say that it is now my practice to avoid (for silver prints) enamelled mounts of all kinds, and to use as far as possible only plain toned mounts of good quality ; these I have found the most reliable and the least likely to cause either spots, stains, or fading.

Notes.

We have repeated some experiments, made by G. Staats, as to the photo-chromatic properties of silver chloride, and although the coloured plate produced is by no means one which would satisfy a chromo-lithographer wishful to make a colour-chart, yet, by to some extent using the eye of faith, one may recognise dull versions of red, green, orange, and blue.

A well-polished plate of silver is allowed to remain in a 5 per cent. solution of ferric chloride until it acquires a slate colour. The plate is now taken out of the solution, after which it is dried quickly and without heat. It is then exposed under red, green, orange, and blue glass. In sunshine the colours appear on the plate after a few minutes; and dissolve readily in aqueous ammonia. If the plate is heated before exposure, it acquires first a violet and then a red colour, and at the same time partly loses its sensitiveness to yellow and green light.

Microscopical research has recently profited much by the introduction of new kinds of glass and corresponding improvements in the objects used, hence considerable interest centres round a series of the lectures which the Rev. W. H. Dallinger will deliver on "Microscopical work with recent lenses, on the best and simplest forms of life." They will be delivered at the Royal Institution on March 8th, 13th, and 22nd.

It surely must be some photographer appreciating our hint of last week who advertises in Wednesday's *Exchange and Mart* for a Police truncheon of the latest pattern. Here is the advertisement:—"Wanted, new Regulation Police truncheon, latest pattern.—4201T"; and one can quite understand the need of having a weapon of the regulation pattern, as the valiant "Special," wishful to be photographed in the full glory of his warlike equipment, would scarce like being taken holding aloft the plain white wood rolling-pin-like substitute for the real truncheon, which the Government was in many cases mean enough to send out instead of the genuine article, to many of the patriotic volunteers who have been waiting vainly and disappointedly in the suburbs, on damp and cold Sunday nights; waiting comfortlessly for the approach of bands of those whom our present Government fears—as, for example, bands of bloodthirsty and ferocious Anarchists, Liberals, Gladstonians, Nihilists, Radicals, Socialists, Terrorists, Social-Democrats, Home Rulers, Dynamiters, or Demonstrators.

The Conversazione of the Royal Microscopical Society, to be held on the 23rd inst., promises to be of unusual interest, as the ordinary programme is to be supplemented by an exhibition by Professor Crookshank, in his bacteriological Laboratory. Professor Crookshank, referring to the subject of the last meeting of the Society, said he proposed to throw upon the screen a number of photographs of bacteria, to show that the results obtained by photography might be used for the purposes of teaching. In the course of his remarks he observed, that with regard to bacteriology, the results obtained by photography had not been simply to obtain artistic pictures. Pathologists did not want to perform feats, but to get the greatest accuracy of detail recorded in as little time as possible. If this be so, it is very clear that photographers are not the best judges as to the respective merits of photo-micrographs of bacteria. This ought to be borne in mind if, at the future exhibitions of Pall Mall or elsewhere, the entries of photo-micrographs are at all numerous.

At the Exhibition of the London Stereoscopic Company in Regent Street, now open, there is a good deal of really very attractive work, and several items in the way of portraiture which are cheering after the outburst of retouched show-case work at Pall Mall. We hope to say more about the matter next week.

One of the features—we do not intend a joke—of the Dulwich election was a portrait transparency of the Liberal candidate, James Henderson, which was exhibited in front of one of the houses. Photography, in combination with the magic lantern, has generally been utilised for this purpose, but in this case a drawing was made by the cartoonist of *Funny Folks*, J. P. Stafford. No doubt the picture was useful in stimulating the enthusiasm of the Liberal electors, and certainly the pluck of the candidate in attacking a stronghold of his political adversaries deserved enthusiasm. We do not see why the use of transparencies should not be extended much further in election contests than has hitherto been the case. Magic lantern slides of the Irish evictions and other scenes have been spoken of in connection with political lectures, but they would have a far greater effect if exhibited publicly during the progress of an election. Possibly we shall see a good deal of this kind of pictorial argument when the next General Election comes on.

Wonders will never cease! Now, in fact, that a lady has actually made the matter of complaint to a photographer that his photographs of her make her too good looking, we have resolved to be prepared for anything. After this it would not surprise us even to glean from the business correspondence such passages as these:—"Sir,—I return the proofs herewith. I like the full-face portrait the better of the two, though even in this one I have to point out to you that the wart at the base of my left nostril is not sufficiently sharp in outline. Could you not manage also to make the line where my artificial plaits join my own hair, a little more palpable? As to the scar on my temple, I must admit that this now comes out much more clearly than it did.—Yours faithfully, Olivia Cromwell."

"Dear Sir,—The plate you send me will never do. As you have taken me, the fact that my front teeth are missing is all but undiscoverable. This must be corrected, and when I sit again, as I must, I hope you will so focus me as to ensure a well-defined reproduction of what needlessly considerate friends ca the 'fluff' on my upper lip and chin. In plainer words, I must insist on my moustache and beard being made duly prominent.—Truly yours, Angelina Smith."

"Sir,—Miss Onesima Patter (B.A. Girton), presents her compliments to Mr. De Cameran, and desires, in returning the enclosed cabinet of herself, to express her deep regret that he has apparently, by some 'ill-advised trick of the trade,' contrived to photograph Miss P. without imparting to the resulting negative that obliquity of vision which exists in the original in so unmistakeable a degree. If Miss P.'s left eye can be altered accordingly, without her again visting Mr. De Cameran's studio, well and good; but rather than be content with the very ordinary pair of eyes given to her in the enclosed so-called portrait, Miss Onesima Patter will sit again with pleasure."

"Sir,—The face of the enclosed carte of myself is sufficiently freckly to satisfy me, and I approve, too, of the realistic way in which you have treated the mole on my neck; but the left hand will never do. Where, may I ask, are my smaller knuckles and the broken chilblain I had on my thumb the day I sat? If these details cannot be faithfully reproduced I will have the carte vignetted.—Yours, &c.—Mary Jane Manchip."

"Mrs. Worthington Blen is sadly disappointed with baby's photo. Mr. Focusser has so arranged the light as to make the darling's hare-lip all but invisible, even to Mrs. W. B.'s maternal eye. Will he please call again, and as soon as possible, as the dear baby's arm is now in a beautiful condition, owing to successful vaccination, and Mrs. W. B. would like it reproduced in the next plate."

"My dear Sir,—I have but one complaint. My wrinkles and crow's feet come out splendidly, but my portrait does not make sufficiently clear the fact that my front of curls is a false one. Please make this fact unmistakeable, and send me three dozen copies, in one dozen of which, as arranged with you, my nose is to be coloured *au naturel.*—Yours truly, Maretia Browne."

Patent Intelligence.

Applications for Letters Patent.

16,576. John Edward Thornton, 3, New Lorne Street, Moss Side, Manchester, for "Improvements in photographic roller slides and mechanism connected therewith.—2nd December, 1887.

16,648. Vernon Warburton Delves-Broughton, 64, Elsham Road, Kensington, W., for "Improvements in cameras."—3rd December, 1887.

16,719. Edwin Jennings Ball, 39, Aynhoe Road, Hammersmith, London, W., for "Improvements in the application of photography to automatic sale and delivery machines, and in the utilization of automatic sale and delivery machinery for the production, sale, and delivery of photographs."—5th December, 1887.

Official Abstracts of Accepted Complete Specifications.

Willis, 1681, 1887. "Printing, colouring, and finishing." Platinotype printing: platinum salts in the developing solution only.

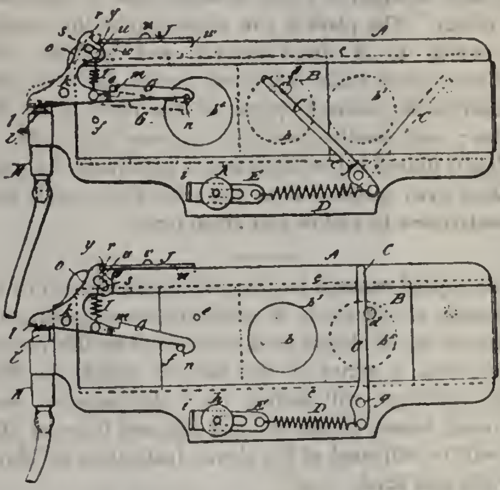
Specifications Published.

14,548. Jean Emile Dessendier, of Roanne, in the Republic of France, Manufacturers, for "A new or improved photometer for use in photography."—Dated 10th August, 1887.

An arrangement for photometry according to the principles of Bunsen and Roscoe. Full specification and drawing will appear next week.

Patents Granted in America.

372,857. William H. Lewis, Brooklyn, N.Y., assignor to E. and H. T. Anthony and Company, N.Y., for "Shutter for photographic cameras."—Filed March 12, 1887. Serial No. 230,641. (No model.)



Claim.—1. The combination, with the apertured sliding shutter B, of the lever C, adapted to throw said shutter, the spring D, and the adjustable slide E, provided with means for clamping or holding it when adjusted to vary the tension of the spring, essentially as described.

2. The combination, with the apertured sliding shutter B, of the lever C, adapted to throw said shutter, the spring D, with its adjustable slide, the double-catch lever G, adapted to engage at different points with the shutter, the spring I, and the adjustable lever-stop J, substantially as specified.

3. The combination, with the apertured sliding shutter B having studs or projections *e f*, of the double-catch lever G, having hooks or lips *m n r*, the spring I, a fixed stop for limiting the movement of said lever, and the adjustable lever stop J, adapted to vary the movement of said catch lever, essentially as and for the purposes herein set forth.

IN NORTHERN LATITUDES WITH A CAMERA.

BY LEWIS MEDLAND.*

Passing through the Spaski Gateway, the principal one of five, which lead to the Kremlin, everyone takes off his hat. I did, but when halfway unconsciously put it on again, but noticing the bare heads of others, and their look of horror, I again hastily removed it. Turning the corner, I saw before me the Iván Veliki Tower, at the foot of which, on a pedestal, rested the Great Bell of Moscow.

It took me some time before I could suit myself as to the best view of this wonderful piece of work; at last I focussed it so as to include a side look at the smaller piece, in order to show the thickness of the metal. I had placed the slide in, set my shutter, and was waiting for a passer-by to get clear, when, coming towards me from behind the bell, I saw a "uniform." By his deliberate stride I felt something was up, so I pinched the pneumatic ball, and awaited results. By this time the "uniform" had reached me. In plain Russian he no doubt asked me by what authority I was taking photographs in the Kremlin, but it is hardly necessary to state that he might as well have addressed a passing dog, which no doubt would have understood him much better than I did. I therefore handed him a slip of paper, whereon was written in the Russian language as follows:—"If you wish for any information, take me to some one who speaks English, or to the British Ambassador." Whilst he was perusing Mr. Warnerke's writing, I was carefully stowing away at the bottom of my bag my slide with the Great Bell, at the same time pulling up an unexposed slide to hand over if necessary. I then commenced to focus the Iván Veliki Tower, but hearing several "koffs" and "whiskies," I looked up from under the cloth, and the "uniform" was saluting me, and pointing in a certain direction. Presuming, therefore, he meant sticking to me, I hailed my droschkie, the driver of which began to go off at the usual quick pace, when another "koff" brought us up at the gates of the Kremlin Police, which I knew by the black and white diagonal stripes on the posts. I followed the "uniform," who looked round at every few steps to see if I was still there, until the gloomy portal of the Police station was reached. Entering a hall, I awaited the "uniform's" report to his chief. The latter soon came and spoke in the Russian language, at which I shook my head, for be it known that a shake of the head in Russia means the same as in England, and so we were getting on. He next asked me if I could speak German? I said only a little. He then beckoned me to his office, and there a cross-examination took place, but as I could only pick up a word here and there we got somewhat mixed. However, I made him understand I should like him to write a letter, which I could get translated for me by the hotel keeper. He asked me something else. I replied to

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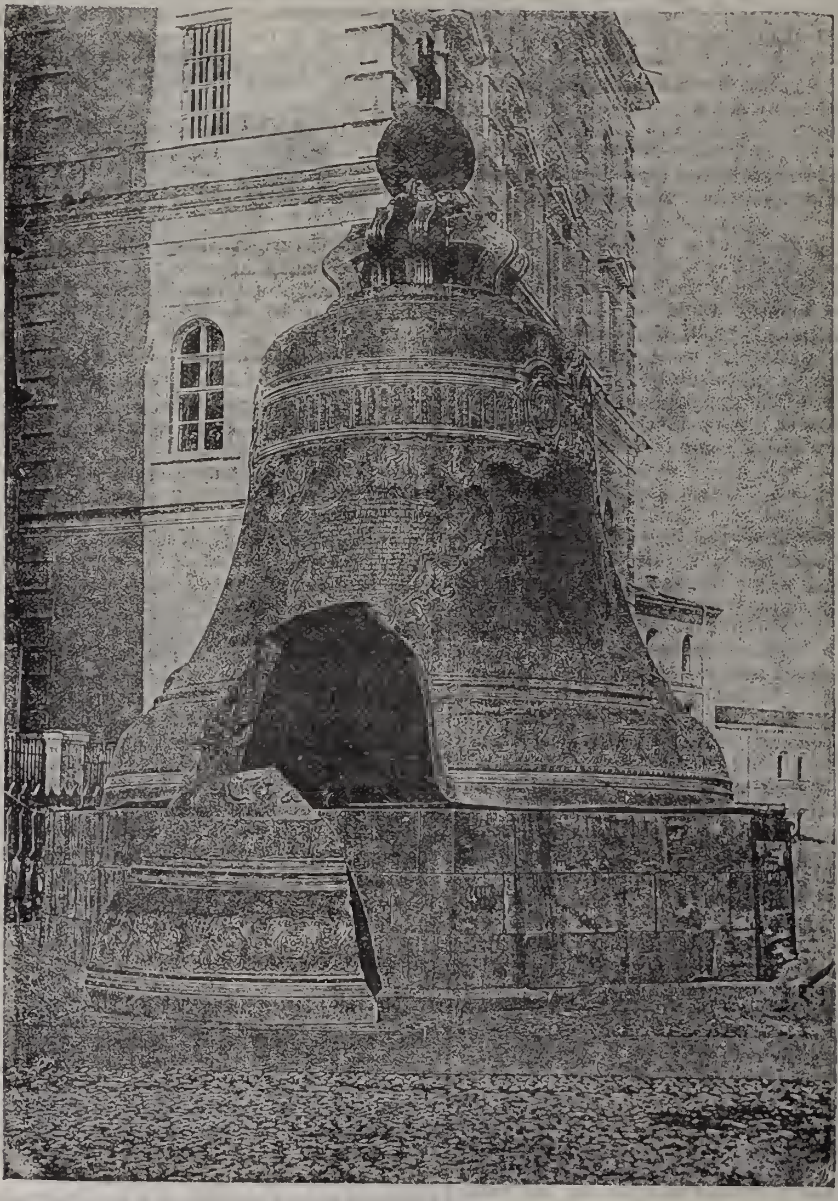
* Continued from page 741.



GREAT BELL OF MOSCOW.
Weight about 200 tons; ditto, small piece, 11 tons. Height, 26 feet 4 inches; ditto, small piece, 7 feet.

what I thought he meant, at which he laughed heartily, until his numerous medals danced again and again. I joined in the laugh, for it is said to be the best thing to do in Russia, when you are in difficulties. We parted friends, the "uniform" leading the way to the street. My driver then went on in the direction he had been told at the hotel, but the "uniform" made him turn round, and go back the same way. Now another difficulty occurred. I could not make the driver know I wanted to go back to the hotel. He looked back for instructions. I looked for "hotel" in the phrase book, found it all right, but the pronunciation was all wrong, and I am sure I don't know when I should have got back had I not caught sight of a mosque in the same street, making him turn up there. A gleam of sunshine at last came on to his much-begrimed countenance. At the hotel I found I had to pay a visit to the city police, so engaging a guide named Robert Heineke, we straightway went through seven departments each one higher than the other, until we reached that presided over by Prince Dolgorouki, the head of the police.

Here I was told I ought to have written; the matter would have then been considered after my political views had been ascertained. To finish this little episode, I was informed that three months would be required before permission could be obtained. As I was leaving Moscow that night I did not waste any more time, having lost some three hours already. Returning to the hotel I found my friends had returned from their drives, who were rather amused at my adventures. After lunch we drove out to the far-famed Sparrow Hills, where Napoleon I. first saw Moscow in flames. In this fire, it is said, some 30,000 wounded soldiers perished. This was in 1812. Of course, Moscow is all re-built, and very much improved and enlarged since then. Taking several views of the city in the distance with trees and the river in the foreground, a crowd collected, out of which I selected some peasant girls, and by dint of signs I made them understand I wished to photo them. On putting my hand up in the usual way for them to keep still, up went all their hands; at this I shook my head and folded my arms, some of them doing the same. At last I capped them, with a drunken man who had had too much "vodki" into the bargain. By this time the reason of this performance had entered the thick skulls of some men, and without much difficulty I secured them also. After scattering a few "kopecks" amongst them we returned to the hotel. It was very remiss on the Czar's part not having a police-officer there to arrest me. Here another adventure awaited me. I could not find any other place excepting a wardrobe, wherein I could change my plates. My light consisted of a safety pin, a 5-kopeck piece, and a five minute match, surrounded by a sheet of orange paper. For fear the door should open I got my friend to lock it. I had changed four plates when it began to get warm, and after the next two plates most uncomfortably so. I knocked, then I called out and kicked, all to no purpose; five minutes passed, and the light went out, and after having howled myself hoarse I was obliged to force as much of the door out as I could, and breathe at the opening. Another five minutes passed, and I felt I must burst the lock, when my friend came running. It appears he had entirely forgotten all about me, and the noise below of the traffic had prevented him hearing me when he was on the balcony. A few "shots" from this balcony and one on my droschkie, horse, and driver, finished my Moscow series.

(*To be continued.*)

Correspondence.

CAMERA CLUB LIBRARY.

Dear Sir,—I will avail myself of the very kind notice you gave of the Camera Club Library in one of your recent issues, and ask permission to take up a small portion of your space and make known our wants to the photographic public. The Committee of this Club is very desirous of getting together a really representative library of photographic works. It would, of course, trespass too much on your valuable space to enumerate all the volumes we require. They are too numerous, alas! But I might mention that we are very short of *British Journals* (the earlier Nos.), *Sutton's Notes*, *Illustrated Photographer*, and most of the early periodicals, especially the American and foreign ones. Of these we are entirely destitute. If any of your readers have books or periodicals they are inclined to dispose of, if they will write to me here, stating their price, I can at least promise them a courteous answer.—With many thanks for your kindness in inserting this letter, I am, &c., Lyonel Clark, *Hon. Librarian.*

Camera Club, Bedford Street, W.C.

THE PHOTOGRAPHIC SOCIETY AND ITS RULES.

Sir,—I observe Tuesday, the 13th, is fixed for the meeting to finally approve the new laws of the Photographic Society of Great Britain. In the copy of the proposed laws which has reached me I note specially No. 13, on "Photographic Exhibition." I find the words "that if the necessity arises for awards, the election of judges be in the hands of the body of members." This is well as far as it reaches; but, unless I have entirely misunderstood the wishes of those members with whom I have come in contact, something far beyond this is wished by most. This is the moment, in my opinion, to carry out the long-desired plan of putting an end, once and for all, to the great complaints of unfair awards, by allowing the body of members of the Society to themselves adjudge the medals, which I propose to effect in this simple manner. Let due notice be given of the day and hour when the hanging is to be completed, and at that time let all members who incline, and whose subscriptions are paid, attend, and, being furnished with a paper by the assistant secretary, and all other persons being excluded, let them then and there examine the pictures, and write on the paper the number and names which in their opinion are entitled to medals. These papers being signed, shall then be handed into the Assistant Sec., and a committee of five of those members then present being appointed then and there, shall at once examine these papers, and from them award the medals to those having the highest number of votes.

I propose, if the state of my health permit, to attend the meeting, and to offer a resolution embodying the above proposal, which I fully believe would put an end to complaints of unfairness in distribution of medals. I respectfully invite members to attend in full force, and, if agreeable to them, to support me on the occasion.—I am, yours obediently, Samuel Fry,

Sherington House, Grove Crescent, Kingston-on-Thames.

FIRING MAGNESIUM BY GUN-COTTON.

Sir,—Reading in a past issue of the Photographic News (as also elsewhere) of a method of firing magnesium by gun-cotton, which Dr. H. G. Piffard, of New York, claims to be a new invention, I write to say that this process is no new novelty, as a Mr. P. Swanson, of Thurso, used that substance more than a year ago for the same purpose, and that the gun-cotton was not lighted with a match, but by means of electricity. I may add that Mr. S. has, to my knowledge, been experimenting for some considerable time past in this matter, and has, I believe, almost completed an apparatus for the working of this method, whereby photos may be taken equal to daylight, and that instantaneously.

Should you consider it of sufficient interest to your readers, my knowledge of Mr. Swanson leads me to believe that he would willingly supply you with a full description of his method of working were you to communicate with him on the subject.—I am, sir, yours, &c.,

F. E. Carter.

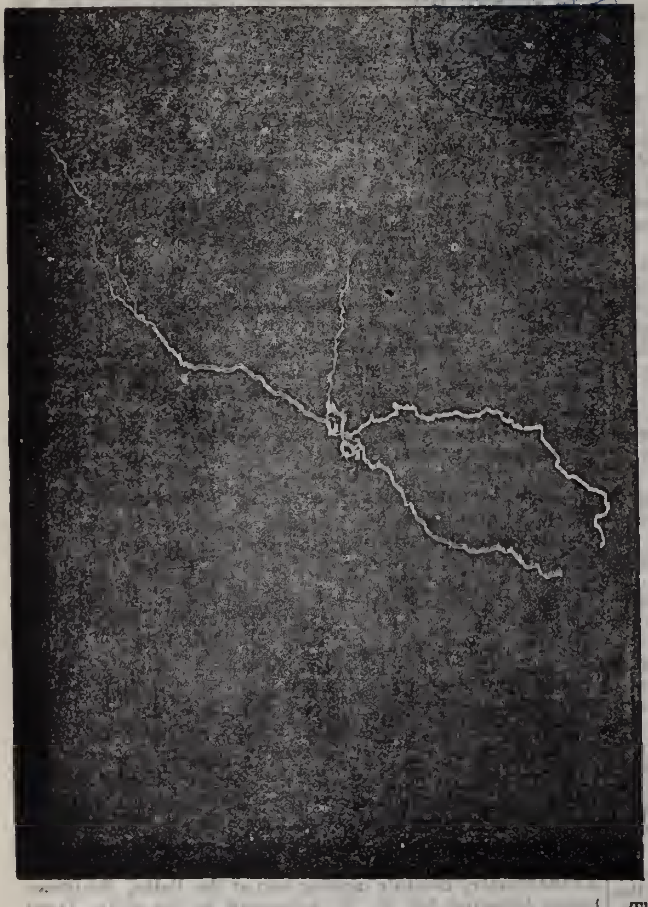
73, *Stirling Road, Glasgow, December 3rd.*

[We shall be glad to receive the particulars referred to by our correspondent.]

A PHOTOGRAPH OF LIGHTNING.

Dear Sir,—In reply to yours I beg to state that the two photos of flashes of lightning, shown by me at the present Photographic Exhibition (No. 375), were taken in Clapham during the thunderstorm of the 17th August last, between 7.30 and 8 o'clock in the evening.

I used a whole-plate camera and a single landscape lens, stopped down to $\frac{f}{32}$. The camera, held in the hand out of an open window, was pointed to the clouds, with the cap off, as soon as one flash was over, and held towards the darkest spot in the sky until there was another discharge. In this way I received the above flashes. The block shows one of them, a magnificent "cloud-stroke," with six branches radiating from a central point, some of them plainly showing their "ribbon-like" shape. In the negative one or two minor branches can be seen, but so fine and faint that they cannot be reproduced.



The plates were Ilford ordinary (whole-plates), the negatives being developed with the pyro-sulphite developer. The development was very slow, and a large quantity of ammonia—which the plates, however, stood very well—had to be used in order to bring out, as far as possible, the different branches of the flash, as they merged into the surrounding clouds.—Yours faithfully,

J. Guardia, F.R.M.S.

Helston House, Rozel Road, Clapham, S.W.

PLATINOTYPE PATENTS.

Sir,—In reply to one of your correspondents, I wish to state that sensitised paper made according to the method published by Captain Pizzighelli, or by similar methods, is fully protected by my patents.

A long experience with printing-out processes in platinum leads me to doubt whether any of them can be made of sufficient commercial value to warrant their introduction; but as some may wish to experiment in this direction I may say that the Platinotype Company will be pleased to aid their licensees by preparing and supplying the necessary chemicals.—Yours obediently,

W. Willis.

29, *Southampton Row, High Holborn, W.C., Dec.* 5, 1887.

[Pizzighelli has published more than one Platinotype method, and our correspondent neither specifies which he refers to, nor quotes the number of his own patent which he says covers it.]

STRIPPING FILMS PATENT.

Dear Sir,—In reply to the Autotype Company's query in your last issue as to the grounds upon which I base my claim, the grounds are those laid down in section 5, paragraph 2, of the Patents, Designs, and Trade Marks' Act, 1883, namely, that I am "the true and first inventor" of the method described in my Specification, No. 15,727, dated 1st December, 1886.—I am yours very truly,

E. W. Foxlee.

22, *Goldsmith Road, Acton, W., Dec. 5th.*

Proceedings of Societies.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 1st inst., at Masons' Hall Tavern, Coleman Street, E.C., W. Bedford in the chair.

F. A. Bridge read a paper entitled "Spots, Stains, and Fading" (p. 774).

The Chairman, at the conclusion, said Mr. Bridge had started a very important subject, and he hoped there would be a good discussion.

J. Hubert said he employed bronze printing on enamel mounts exclusively, without getting spots. These mounts were produced in Germany.

H. M. Smith showed a print badly faded by bronze powder. It was the work of a well-known firm who employ bronze printing on the mounts they issue.

A. Cowan remarked that there were several kinds of bronze powder, some of which was said to be brass. He once saw a print mounted on bronze, and no bad effect resulted.

W. H. Prestwich used bronze printing for many years, but the prints were dried off very quickly, which might account for the difference of experience.

The Hon. Sec. had seen a photograph wrapped in a packet of bronze powder for some time, and no fading of the print took place.

A. Haddon stated that Dutch metal was occasionally used for cheap bronze.

The Chairman had noticed spots something like those shown by Mr. Bridge, which were attributed to sulphur deposited from the use of a coke fire. He had also seen a photographer's name distinctly imprinted on a photograph through contact with bronze printing.

J. Traill Taylor remarked that bronze powder was not the only cause of spots in prints other than from defects in a negative. Some time ago he obtained the phenomenon by smartly tapping a gas burner above some prints; the minute particles of dust thus disengaged caused spots. Then spots were sometimes caused by particles of lime in the washing water, also from the use of white composition rubber tubing occasionally fastened to the spigot. He had known spots to be produced on prints by the mere action of shaking a daily newspaper over them; he would not say whether a chloride or an anti-chloride was in this instance disengaged. That there was bronze and bronze there was little doubt. He once painted a design with bronze powder over a portrait; it was a long time before any development of a bleaching action appeared. In fact, it took such a long time that the print had to be placed in an impure atmosphere. The photograph had been mounted with office gum, which would contain some acetic acid; so that fading might have been as much due to the acid as the bronze. Eventually spots appeared freely on this print. He considered bronze to be an unmistakably nasty thing to have about a photographer's premises, and so much is Mason of Glasgow impressed with this view, that whenever any of his customers order bronze-printed mounts they take them at their own risk. In connection with glazing, he thought it open to question as to the composition of the glaze, and what specific action it would have on photographs, assuming spots appeared after mounting.

W. M. Ashman alluded to the danger photographs were placed in after completion, both from loose particles of bronze, and imperfectly washed paper, such as may be met with in photographic albums. Hypo or chlorides might thus at any time become active agents in destroying the photographer's work when moisture was present.

J. Hubert said that keeping prints in contact would often cause spots.

P. Everett spoke of white paper being bleached with chloride of lime, and pointed out the possibility of blotting pads communicating traces of this agent to the silver image and bleaching the parts where contact was established.

The Hon. Sec. knew a case wherein a spot had been purposely made on a print by means of oxygen.

J. W. Zaehnsdorf pointed out the tendency of flour paste, starch, and other mountants to become acid in a very short time; he had seen delicately coloured paper destroyed by the use of such a mountant kept only from Saturday to Monday. Cardboard prepared with sour paste would, he said, possess a mildew smell after being kept awhile.

A. Haddon wished some chemist in the Society would make known what became of the silver after fading had taken effect in a print. With ordinary bronze and with dust given off from a gas burner, the active agent would be sulphur. Then, again, in the atmosphere there existed thousands of particles which became deposited on prints. These would, for practical purposes, be akin to sulphuric acid,

A. Mackie remarked that as a toned print was affected, and presumably the gold and silver therein contained were acted upon in the same manner, it would be interesting to trace what effect could be produced on a platinum image.

W. M. Ayres attributed much of the present day fading to the general use of stale albumen, and in support of his opinion he said that upon one occasion he albumenized paper on the same mixture for fourteen days in succession. The last floating rapidly turned yellow after finishing.

J. T. Taylor understood that all makers of albumen paper allowed the albumen to stand several days before coating, in order to obtain a higher gloss.

A discussion upon washing prints more or less thoroughly ensued, and instances were quoted in which very slight washing had produced no evil effect on prints kept some years afterwards.

A. Mackie fully detailed the theory of fixation, and showed how probable it was that silver prints faded from imperfectly performing the work.

A question was read regarding the qualities of a plate containing the maximum of silver bromide and the minimum of gelatine.

Opinions varied, and it seemed that the kind of gelatine used, as well as the process adopted, had very much to do with the matter of quality. Wolff's patent adhesive mounts were exhibited.

J. T. Taylor remembered mounts of that sort as far back as 1876, when he was shown a specification, but there was a difficulty in getting a patent. He stated to the authorities that such mounts were likely to be useful in photography, notwithstanding that a patent was refused, and now one had been granted for identically the same thing.

The Chairman then called attention to a photograph of a gas flame illuminated by a flash of Piffard's magnesium and gun-cotton mixture.

J. T. Taylor spoke in favour of camphor as a preservative of albumen, gum, and mountants. He had kept albumen perfectly sweet for fourteen months by means of floating a small lump of gum camphor on the solution.

F. A. Bridge had used camphor in the sensitizing bath to prevent blisters, and it was effective.

H. M. Smith said gloy was a substance much used by professional mounters and fancy box manufacturers. How was it prepared?

J. W. Zaehnsdorf replied that it was a decoction of Irish seaweed. It was extremely useful for some purposes, but not desirable for mounting photographs.

E. Clifton found it caused photographs to fade. The properties of camphor, when used for improving the illumination of an oil lantern, were next referred to, both with mineral and other oils; increased illumination and absence of smoke or smell were said to be the chief characteristics.

J. Hubert had tried photographing sitters with the Piffard gun-cotton and magnesium mixture, and thought the free use of reflectors would make the method practicable for portraiture.

J. Traill Taylor said when the subject was before the South London Society in 1865, he showed pictures taken instantaneously with a flashing light obtained from the combustion of chlorate of potash, sulphide of antimony, and magnesium filings. Mr. Skaife had taken out a patent for the same thing in which photographs were taken by what was called the pistolgraph in an infinitesimal space of time, so the idea was not so new as their German friends would have them believe. The matter would be found fully reported in the two journals of that time.

H. M. Smith showed a transparency similar to Mr. Jackson's, having the red and blue colours distinctly marked. He could not explain how produced, but he had seen dozens almost as strongly marked in the same collection.

A. Cowan showed a very good positive image produced by dissolving away the gelatine of a negative in hot water. Mr. Warnerke had said that light and developer made the image insoluble when acted upon from the back. Here it was reversed.

C. P. Cembrano handed round a few platinotype prints for inspection.

W. M. Ashman exhibited and explained the advantage of H. J. Burton's actinometer for indicating the time required for printing carbon tissue, platinotype, &c., from negatives of any degree of density.

It was announced that on the 15th inst. W. H. Harrison will read a paper on "The Lantern and Lantern Slides of the 19th Century," and on the following week Norman Macbeth will lecture on "Art" as applied to portraiture.

A vote of thanks to F. A. Bridge for his paper brought the proceedings to a close.

Photographers' Benevolent Association.

The committee met on the 1st inst., when they discussed the best means of attaining the fulfilment of the stipulated conditions of the special Orphanage Fund, viz., to raise the sum of £500 within one year, the originator having given twenty guineas to start the fund. It was thought that this sum could be raised amongst photographers, and a sub-committee was appointed to draft a prospectus for issue to all connected with the profession. The following sums were also promised:—The Chairman (W. M. Ashman), £10 10s.; W. Bedford, £5; J. Zaehnsdorf, £2 2s., and through a member of the committee, £1 1s. Mr. Bedford also stated he believed he could bring another donation of £10

C. Darker, of Forest Hill, was elected a member of the Association, and T. S. Hicks was appointed local secretary for Sheffield district.

Bolton Photographic Society.

At the ordinary monthly meeting held at the Baths, Bridgman Street, December 1st, E. N. Ashworth in the chair, Jabez Boothroyd gave a lecture on "Photographing in Colours," in which he took the negative. A discussion followed.

Dr. Johnston exhibited a series of views from various countries, which were examined with interest.

Glasgow Photographic Association.

The first popular meeting of members and friends was held in the Large Hall of the Philosophical Society's Rooms on November 10.

W. Lang, Jun., occupied the chair, and introduced T. N. Armstrong, who delivered a lecture entitled "A Trip to Brighton," which was illustrated by a series of limelight views, and proved very interesting. A short poem, illustrated with slides, was read, with much acceptation, by Mr. Armstrong, the meeting all through being of a very agreeable nature. The audience, too, was one of the largest that has yet assembled at any of these popular meetings.

The usual monthly meeting of the Association was held in the Philosophical Society's Room, 207, Bath Street, on December 1. W. Lang, Jun., occupied the chair. A very large audience was present. R. Rae, W. H. Turner, and ex-Bailie Crauford, were unanimously admitted members of the Association.

T. N. Armstrong then read his paper on "Photographing by the Flashing Magnesium Light" (see page 773). An extemporised studio having been fitted up in the rooms, a demonstration followed, when Mr. Mason and Mr. Sloan sat for their portraits; and when the negatives obtained were developed they showed clearly that the light thus arranged and adapted was all that could be desired for the purpose, After the demonstration of the light, the negatives, which were taken on Eastman's films, were developed, as has been said, and the method of stripping, fixing on extra support, &c., was shown by Mr. Armstrong.

Mr. Urie said that of the many lights he had tried he had not in all his experience seen one which was likely to prove so successful or so easy of adaptation as the one shown to-night. He was sure that it would entirely supersede all others now in use. The films also, he thought, were likely to come more and more to the front, removing as they did the unwieldy glass plate, and doing away with the weight of the glass, which was a thing greatly to be desired, as the weight of a photographer's negatives caused a great inconvenience. Altogether, both demonstrations had proved very successful, and he was sure many would be induced to make a trial of the light after the splendid results which had just been obtained.

Mr. Stewart said that Mr. Armstrong's demonstration had proved the great advantage such a light must be to those engaged during the day, and who had no time except at night, to devote to photography with the simple expedients seen to-night, which were easily procurable in every house. Amateurs were placed in a position to take advantage of the only time at their disposal. He, however, disagreed with Mr. Armstrong regarding the loss of the powder in blowing it through an ordinary gas jet; from the experiments he had made himself he found a considerable quantity was blown through without igniting, and was thus wasted. He would recommend instead that a large Bunsen burner be employed, and that a long thin tube be used (in which fifteen grains of the powder had been placed—that being about the quantity necessary) to blow it into the flame, thus securing an equal light every time, along with more perfect combustion.

Mr. Armstrong, in repy to Mr. Stewart, said that while experimenting he had tried the Bunsen burner, but dispensed with it, as he thought a greater amount was blown through without ignition than in the ordinary gas jet. He found also that the Bunsen burner was exceedingly difficult to fix without casting a shadow, while a light gas jet could be readily placed in any position, and no shadow was cast from it. Regarding the tube, with a measured quantity of powder, he thought it a very good idea, but thought the wash bottle could be adapted with a bulb to blow just a certain quantity every time, and thus save the difficulty of measuring for every discharge.

G. Bell suggested that the magnesium light might be burned in a lamp with a chimney to carry away the fumes, as they were anything but pleasant, and he was sure would—if a number of photographs were done at the same time—soon fill the room or studio with smoke, and put a stop to any further photographing.

The President then read his paper on "Removing Gelatine Films from their Glass Support, and Conversion of an Ordinary Negative into a Film Negative" (see page 772).

The paper was intended to stimulate experimenters to try, if possible, to remove the film in such a manner that as the glass may be itself uninjured, while the film is removed without injury, so that it may be preserved and printed from. Mr. Lang passed round some he had stripped in the manner described in his paper. These showed that there was something in his suggestions which might easily be developed were someone to experiment in this direction. After the reading of the paper, Mr. Lang showed the removal of the film from its glass support; but, as the hour was now late, he did not succeed in time in adjusting it to the Eastman film (which he uses as a support instead of the glass) to show the final result to the meeting.

Camera Club.

On December 1st, T. C. Hepworth delivered a popular address to the members on "The Application of Photography to the Arts and Sciences." H. Trueman Wood occupied the chair. The lecture was fully illustrated by means of the optical lantern. Mr. Hepworth described several of the processes used in photography, and showed transparencies to illustrate the characteristics of different methods. Slides, showing the uses of photography in microscopic and telescopic work, and illustrating spectrum analysis, were also put through the lantern in connection with the course of the lecturer's remarks.

Discussion and conversation followed, in which the Chairman, Lyonel Clark, Rodgers, Davison, Ferrero, and Spiers took part, and the proceedings were brought to a close by a reply from Mr. Hepworth.

On Thursday, December 15th, the 200 English lantern slides intended for the American exchange of this year will be exhibited. Meeting at 8 p.m.

Tunbridge Wells Amateur Photographic Association.

The first exhibition of this Society, which now numbers twenty-four members, was held on November 28, the pictures exhibited for competition having been taken during the present year. The prizes, with the exception of a medal given for the most artistic picture, were in the form of money, to be spent in photographic apparatus. In all, 221 pictures competed for the prizes, and a large number were sent "not for competition."

In class 1—Architecture—the first prize was taken by a view of the interior of St. James's Church—a bright little picture of good technique. The second prize went to the Rev. J. E. Rogers, for a well-rendered presentment of St. Hilda's Abbey. The first prize for landscape was awarded to C. L. Coppard, for "Storm Clouds." The second prize was taken by a view by Mr. Gibson, the secretary, of nearly the same part of the Common, but under a totally different effect. There were no examples to be seen of the results of the "detective" cameras with which some photographers now go armed; but there were many varieties of the photograph which is produced by pulling a trigger. The first prize in this class was taken by Mr. Gibson, with a pretty exhibit of a rustic "Feeding poultry," in which the cocks and hens, pigeons, and other small deer are clearly defined in a picturesque group. The second prize was awarded to Mr. Calway, for an apparently patiently-waited-for group "On the sands." In portraiture, Mr. Whitrow's group of ladies took the first prize; the second prize being awarded to J. W. Morgan, for "A boy with a Violin." The medal for the greatest artistic excellence was awarded to C. L. Coppard for "O Sportsman, spare the Snipe."

Among the other exhibits, as already remarked, were many which were not sent in competition. Sir David Salomans, who was present at the exhibition, sent some interesting contributions of this class. First and foremost should be mentioned an "enlargement" of a view which he obtained of the Queen's Jubilee procession, as it was returning from Westminster Abbey. Sir David also sent a very fine head, the subject being a young lady, and some very good studies of the sea, sharp, clear, and, above all, having the true "feeling" which such scenes should convey. Frank G. Smart contributed a number of Alpine views, and some seaside pictures, one of them having a special interest of its own from the fact that it portrayed the new lifeboat which Mr. and Mrs. Smart some time ago presented to one of our waterside towns. Mr. Whitrow sent a fine collection of views in Cornwall and Devon, which did not appear before the judge. This exhibitor sent some exquisitely picturesque presentments of shipping and harbour scenes, taken in those old smuggling towns of Looe and Palperro, besides well chosen and delicately rendered transcripts of the whitewashed cottages in Devonshire villages. The Rev. A. T. Scott sent a very varied collection. One of the largest exhibitors was Dr. Horace Day, of Tonbridge (President of the Postal Photographic Society), who appears to be an indefatigable worker, both in small and large sizes, sending no less than 51 examples. J. Chamberlain exhibited a photograph taken by means of a pinhole perforated in cardboard, in front of the lens. He also exhibited several interiors of a room, which were clear and good. Miss Priudeaux sent a number of landscapes in sepia platinotype, many of the scenes being on the Norfolk Broads. Archie Pearce sent some interesting views of North American scenery, also in the new platinotype form of printing. Some other pictures hailing from over the "herring-pond" were sent by W. Chamberlain, including several instantaneous views of the blowing up by dynamite of the sunken rocks which obstructed the New York Harbour. Other exhibits which did not compete were contributed by W. E. Brampton, C. D. Morley, A. W. Pierson (who showed glass slides for a lantern), J. G. Calway, J. G. Ashby, C. L. Coppard, Harry Jenkins, and Miss Eames, who sent four landscapes. Perhaps the greatest curiosity was the collection belonging to a deaf and dumb amateur, named

Turner, who had made himself a camera out of old cigar-boxes, with spectacle-glasses for the lens, and with such primitive tools had done some very passable things, which pointed a very strong moral as to the fruits of perseverance under difficulties. In an adjoining room were also some specimens of photographic appliances, instantaneous shutters, and so on, which were scrutinised by the uninitiated with a considerable amount of interest.

Altogether, the exhibition was regarded as an unqualified success. During the winter the Society hope to be busy with an enlarging lantern, which has just been presented to them by Sir David Salomans.

Barnet Elizabethan Photographic Society.

On Monday evening last there was inaugurated at High Barnet a Society in connection with the ancient Grammar School of the town under the above title. A meeting was held for the purpose of bringing together present scholars, old boys, and friends, some of whom are already photographers. The head master, the Rev. J. Bond See, M.A., who took the chair, was unanimously voted president, and a committee was appointed to draft rules and regulations.

T. Samuels sketched concisely the past and present state of the art, and the benefits arising from a union of workers, basing his remarks upon a practical experience of thirty years' standing. In his exposition he was assisted by A. Mackenzie, who kindly put his lantern at the disposal of the young Society, and by its means were exhibited some of the possibilities of modern photography, including a fine series of micro-photographs, local objects of interest, Scandinavian views by an old boy, &c.

Liverpool Amateur Photographic Association.

The annual meeting was held on the 24th ult. at the Royal Institution, Colquitt Street, George H. Rutter in the chair.

W. C. Bustard and T. O. Forshaw were elected members.

The Hon. Secretary read his annual report, of which the following is an abstract :—

During the year nineteen new members have been added, and thirteen have retired or lapsed, bringing the total number to one hundred and forty-six, a growth which is satisfactory, though not apparently so large as in some previous years, when it is remembered that it represents an actual addition of the working strength of the Association of more than a dozen members. In addition to papers and discussions, interesting exhibits of work and apparatus have been made by many members. At the March meeting the annual lantern slide competion was held, at which there were five competitors, who sent in three slides each. It had been decided by the committee that the prizes at this and, if possible, all future competitions, should consist of medals, and accordingly the silver medal was awarded to A. W. Cornish. The annual competition was held as usual. The prints were sent in at the October meeting, and the judges gave their decision in writing during the ensuing week. Eleven competitions were sent in, and the result of the competition was that the prizes for "Street view" and "Architectural" were awarded to A. W. Beer; those for "Bridge" and the "Best picture taken at an excursion," J. H. Day; that for "Marine" to T. B. Sutton; and for "Instantaneous" to Mr. David Lewis. As it had been felt for some time past that the nature of the prizes given required revision, neither money prizes nor prints appearing quite satisfactory, the Council have had under their consideration for nearly the whole year the advisibility of substituting medals for any other form of prize, thus assimilating the practice of this Association to that of the more important photographic societies elsewhere; accordingly the nature of the prizes was not announced at the beginning of the year, but the question was left open for future decision. At the Lantern Slide Competition in March, a silver medal was awarded, but this was not the Association's own medal, hence this form was unsuitable for permanent adoption, and it was found impracticable to adopt any permanent form of prize until the Association had its own medal. After much discussion a design has been selected, and the die is in progress of execution, and as this decision was come to before the prints in the annual competition were actually received, the council decided to give the medal to those prize-winners who preferred to receive it. The gentlemen named above are therefore entitled each to a bronze medal. The council believe that the substitution of medals for prizes of a more ephemeral nature will prove highly satisfactory to the competitors themselves, and that it will lead to a more general interest being taken in the prize competition, and to a larger number of members striving to secure so honourable a reward for their work.

The Council selected two negatives, viz., "A Cheshire Lane" (by Mr. Beer), and "Doorway at Tabley Hall" (by Mr. Day), for reproduction as representation prints for last year. They were accordingly executed in carbon as 15 by 12 enlargements, and copies have been presented to all members who have paid their subscriptions for 1886. For this year a suitable presentation print or prints will be selected and distributed among the members elected prior to October, 1887. It was not thought desirable this year to take the usual part in the associated *soirée*, mainly on the ground that with the large variety of interesting objects there exhibited photographic objects scarcely seemed to secure their due share of attention; and it has been decided that the Association shall have its own *soirée* and exhibition of photographs, in hopes that thereby the general public may be enabled to have a better idea of the progress photography is making.

The Hon. Treasurer next read his report and balance sheet, which were highly favourable.

Both reports were unanimously adopted.

The election of officers was then proceeded with, the following being duly elected :—

President : B. J. Sayce.
Vice-President : F. T. Paul, F.R.C.S., and H. N. Atkins.
Treasurer : Joseph Earp.
Librarian : Walter Hughes.
Auditor : H. Kirkby.
Hon. Secretary : W. A. Watts, Farnworth, Widnes.
Council : P. Lange, H. Lupton, W. P. Riley, and G. H. Rutter to replace the four retiring members.

E. Twigge exhibited a series of lantern slides mounted as transparencies, developed by various processes, as an illustration of the nature of the slides desired by the Recreative Evening Schools Association, of which Miss F. Calder is Hon. Secretary. He recommended their undertaking to the attention of the members, and pointed out how they could assist them by undertaking to make some lantern slides illustrating the fifty years of the reign of Queen Victoria.

Talk in the Studio.

London and Provincial Photographic Association.—On Thursday, December 15th, a paper will be read by Mr. W. H. Harrison on "The Lanterns and Lantern Slides of the Nineteenth Century."

Woodbury's Hypo Eliminator.—We have received a bottle of the above: and it appears to consist of a solution of a metallic hypochlorite. The vendor recommends the addition of a few drops to the last soaking water for prints and negatives.

A Legal Dispute about Retouching.—A case which created some interest was adjudicated upon at the Woolwich County Court last week by Mr. Powell. Messrs. Long and Faulkner, photographers, Woolwich, sued Mrs. Pearson, wife of an Arsenal *employé*, for £2 8s. 6d. for portraits supplied to her order. Plaintiffs stated that when the photographs were complete Mrs. Pearson called with her husband and saw them, promising to call in again and pay for them. No complaints were made, and as she did not call, the likenesses were sent home, and subsequently returned with some frivolous complaints. An action was then brought against the husband; but it fell through, the wife asserting that she had a separate income. Two photographers now attended, and expressed an opinion that the likenesses were correct, but admitted that the negative had been "touched up" to meet a common requirement of customers to look their best. Mrs. Pearson said she did not wish to be "flattered and tittivated up." In trying to make her look younger, they had almost wholly lost the likeness. They had made her hair waved, whereas it was not so. Plaintiffs, in reply to the Judge, said it was not within the photographic art to make hair, which had been photographed plain, appear to be waved. The Judge said the photograph certainly made the lady look younger than she now appeared to be. She did not give the photographers any specific orders to make her appear "just as she was," and the ordinary course of procedure—viz., to make the customers look their best—was followed. He considered that they were reasonable likenesses, and ordered payment of the amount sued for.

OXYGEN, CARBON, PLATINUM, AND OTHER ELEMENTS IN THE SUN.—By J. Trowbridge, C. C. Hutchins, and E. L. Holden (*Phil. Mag.* [5], 24, 302—313, and 225—330).—In these experiments, a powerful alternating current was caused to pass between electrodes of aluminium, and the spectrum, obtained by a grating, photographed on one half of a photographic plate, then, without altering the arrangement of the apparatus, sunlight was admitted, and its spectrum photographed on the other half of the plate. The wave-lengths of the air or sun spectra were tabulated. The authors point out that in order to be certain of the existence of an element in the sun, the coincidence of a large number of the lines of the element in position and grouping with the dark lines of the solar spectrum is necessary, or else a general similarity in the character of the lines; they find no such coincidence for oxygen so far as they have examined (wave-lengths 3,749·8—5,033·85). They find that the bright lines of Draper's spectrum vanish in their high-dispersion apparatus, and contain numerous dark lines, and, moreover, that there is no general coincidence between the oxygen lines and the bright spaces of the solar spectrum. The authors also find that the solar spectrum near H contains dark lines exactly agreeing with the spaces between the bright lines of the flutings of the carbon spectrum. The carbon spectrum is wanting in the green and blue. This may be due to the effect of vapour in the sun's atmosphere, the lines due to any element being unaltered, obliterated, or reversed, according to the temperature of the vapour through which the light passes. The temperature of the luminous vapour itself may also vary. Further, the spectrum from one element may be partially obliterated by the passage of the light through the vapour of another element. The photographic spectrum of carbon can be obliterated in the green and blue by superimposing upon it that of iron, of nickel, and of cesium. The fluted carbon spectrum of the voltaic arc is due to a reversal of the continuous spectrum of the ignited carbon by its own vapour; hence the temperature of the sun's atmosphere where the carbon is volatilised must approximate to that of the voltaic arc. The spectra of different metals in the voltaic arc have been compared with the solar spectrum, and the authors confirm the results of Lockyer for the metals cadmium, bismuth, silver, potassium, and lithium, whilst they find insufficient coincidence for the metals, lead, cerium, molybdenum, uranium, and vanadium. Platinum, which has not hitherto been found in the solar spectrum, gives 64 lines between wave-lengths 4,250 and 4,950, 16 of which agree with solar lines, whilst seven are doubtful.—*Chemical Society Journal.*

SOLUTIONS FOR THE NEW PLATINOTYPE PROCESS OF PIZZIGHELLI.—Several of our readers having complained of the difficulty of preparing the ferrric oxalate solution for this process, and of obtaining the chloro-platinite of potassium, we are glad to hear that Harold Senier, Photographic Chemist, of 88, Norwood Road, intends to introduce these preparations into commerce.

PHOTOGRAPHIC SOCIETY OF GREAT BRITAIN.—The next ordinary meeting will be held on Tuesday, December 13th, at 8 p.m., in the Gallery, 5A, Pall Mall East, after which the adjourned Special General Meeting will take place, for the final acceptance of the proposed new laws.

PHOTOGRAPHIC CLUB.—The annual dinner will take place on Wednesday, December 14th.

To Correspondents.

⁂ Communications intended for the Editor should be addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, E.C."

⁂ We cannot undertake to return rejected communications.

E. M.—Thank you for the photograph, which is a capital portrait study; but we cannot see our way to using it as a supplement just now.

MORE LIGHT.—1. Longer exposure and slower development; with a slight diminution of the quantity of pyro. 2. By a kind of stippling, in which the dots are not sharply outlined, but merge into each other. 3 and 4. See the forthcoming YEAR-BOOK.

ESSEX.—Rub up moist water-colours with white of egg, and apply this to the dry print before squeegeeing it on the polished surface. When the colour is dry, coagulate the albumen by means of a mixture of three parts of methylated spirit and one of water. Then soak your print and squeegee on to the smooth surface.

G. C. G.—Boiling water and a stiff brush.

W. S. ANDERSON.—About two feet is a convenient height.

W. H. BANKS.—1. The latter is a silver emulsion, but with collodion as a vehicle; we have not seen very black tones obtained with it, neither did we succeed in getting such tones, although we tried. 2. We cannot tell you, as Obernetter has published much on the subject; further particulars should have been given. It varies so much according to circumstances that you had better refer to the Table of Lyonel Clark and E. Ferrero, published in the PHOTOGRAPHIC NEWS for October 14th.

ALFRED ROGERS.—The letter has been posted; and you will probably obtain the condensed hydrogen from the same firm.

W. T. LUCK.—See page 162 of the YEAR-BOOK, second paragraph.

EDWARD PEPPER.—A collodion transparency is made upon glass which has previously been French chalked, and when this transparency is finished and washed, a piece of gelatinized paper is squeegeed down upon the positive, and the whole is allowed to dry, after which the paper is stripped off, taking the collodion picture with it. Such gelatinized paper as is sold under the name "double transfer for carbon printing," answers well. It is soaked in warmish water till the coating is decidedly soft, when it is ready for squeegeeing on to the collodion image.

JOSEPH B. FOSTER.—We have obtained camera bellows from the Photographic Artists' Stores at Charterhouse Square, London, E.C.

W. CLAYTON BOWER.—It is quite clear that the reading should be "forty-eight thousandths."

LENS.—The photographer who in this country has undertaken to puff the lenses in question can doubtless supply them, but we are under the impression that the particular instrument he so strongly recommends has never been made; still, you will be able to get the smaller sizes. Forward us your address, and we will let you know the name and address of a photographer of reputation in London who has actually tried the lens in question, and who expresses a very decided opinion with respect to it.

C. C. VEVERS.—We have a package for you which we will send if you will forward your address.

J. K. MACKAY.—1. The very first photographic plates—those of Nièpce (asphalt) and of Daguerre (silvered copper)—were dry plates. The former were made and used during or before 1827. 2. To write an essay on the progress of photography requires more knowledge of the subject than can be got by the mere perusal of an elementary work, and we do not know of a single work which by itself will be likely to be much use. Harrison's papers on the History of Photography may help you, also his series on the Bibliography of Photography in the back volumes of the PHOTOGRAPHIC NEWS.

⁂ Several answers stand over.

Photographs Registered.

W. J. BYRNE (Richmond)—10 Photos. of the Duchess of Albany; Photo. of the Duke of Albany; 2 Photos. of the Princess Alice of Albany; Photo. of the Duchess of Albany and her two Children; 5 Photos. Groups of Duke and Princess Alice of Albany.

W. S. FOTHERGILL (Stockton-on-Tees)—2 Photos. of Scenes in Kahylia.

W. V. AMEY (Landport)—2 Photos. of the Rev. E. Holroyd; Photo. of Charles Bradlaugh, M.P.

The Photographic News.

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For Advertisement Scale see page v.

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THE PHOTOGRAPHIC NEWS.

LIBRARY

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THE PHOTOMETER FOR USE IN THE FIELD.*

With respect to the screen photometer forwarded to us by the London Stereoscopic Company, and noticed by us last week, Messrs. Marion and Co. write, under date December 10th, as follows :—

"Dear Sir,—With respect to the photometer illustrated in the Photographic News of December 9th, page 770, we beg to inform you that this instrument is the invention and manufacture of J. Decoudun, of Paris, and we have had stock for sale some time. Moreover, it is a modified copy of Warnerke's actinometer, and the principle of its use is clearly pointed out by J. H. Storey and W. O. Roper in the *British Journal Almanac*, 1884.—Yours truly, Marion & Co."

We are glad to find that Messrs. Marion and Co. have —like the Stereoscopic Company—the instrument on sale; but think that the latter should not have sent it to us as "their" instrument unless the production and sale were under their control exclusively. It will be noticed that in the advertisement, which appears on page 15 of the News last week, the Stereoscopic Company refer to the photometer in question in the following words : ". . . . And now offer their 'Perfect' Photometer with the greatest confidence, ..." an expression which appears hardly justified if read by the light of Messrs. Marion's letter.

A few more words with respect to the photometer itself. It is, as we stated last week, "on the screen principle," a class which not only includes Warnerke's, but several others, and the special merit of this is its compactness, lightness, and the convenience with which it can be used; and indeed, as we said before, "we have not met with any apparatus of the class which pleases us so much as that now before us."

Messrs. Marion and Co. enclose with their letter the article of J. H. Storey and W. O. Roper, to which they refer (*British Journal Photo. Almanac*, 1884), and we make the following quotation :—

"In trying to arrive at the proper length of exposure for photographic plates, without the trouble of calculation, the writers hit upon the following application of Mr. Warnerke's actinometer :—

"It seemed that if, instead of determining the actinic power of the light proceeding from the sky to the object, and then calculating the amount of light reflected from that object into the camera, the light which was proceeding from the object could be examined and determined upon the ground glass of the camera itself, a step in advance of the work done by ordinary actinometers would be attained.

"To do this the luminous tablet of Mr. Warnerke's actinometer, with its accompanying scale, is removed, the tablet not being used in the process at all. The observer is now in a position to examine, by means of the graduated glass disc of the actinometer, the light streaming through the round hole which is ordinarily immediately above the luminous tablet. The observer next looks at the picture on the ground glass, and decides which portion of the picture shall determine the exposure of the remainder, the darkest part being probably the part selected. The actinometer (modified as above) is placed against the ground glass, the hole in the bottom being immediately above the part selected. The observer now looks through the small microscope, the graduated glass disc being in its place. If the latter be slowly rotated, commencing at the letter A, it will be found presently that a point is reached at which one letter is just visible, and, on the disc being further rotated, the next letter is too indistinct to be made out.

"A reference to the scale attached to the instrument shows the observer at a glance the ratio which that letter bears to any other. Thus, if the letter Z be turned to the figure 1, then N is seen to be equal to 14, M to 18, L to 23, and so on. If, then, the correct exposure for a light equal to any one letter on the scale can be determined, other letters will bear a direct proportion to this according to the scale given.

"To illustrate further :—Another darker picture was focussed, and the light again being examined through the modified actinometer was found to show the letter N. The letter Z was then turned to the figure 1 on the scale, and N was found to be opposite 14. As the correct exposure for Z was previously determined, as we have seen, to be two seconds, the value for N will be 2 × 14=28 seconds. An exposure of 28 seconds was accordingly given, the negative developed, and found to be correctly exposed.

"Out of dozens of plates which the writers have exposed by this method in England and various parts of the continent they have never had a failure. Of course every different class of plates requires its own standard of exposure to be determined, as also every different camera, the latter necessity arising from variations in density of different ground glass. But, having once decided the standard of exposure for a certain camera and class of plates, the exposure for any view in any country may be readily determined without regard to the lens used or the size of stop in that lens. It was found that, when working in the bright light of southern France and northern Italy, if the light on the ground-glass screen was examined immediately after gazing at the white roads or other bright objects a different reading was obtained to that arrived at when the head had been from forty to sixty seconds under the black cloth. After that time the reading became constant. This showed that the eyes, after gazing at brilliant objects, required at least one minute in a subdued light to return to their normal condition, and that only then could a correct reading be taken."

Although the Warnerke actinometer, when used without the phosphorescent surface, and in the way advocated by Storey and Roper, may be considered as a very near equivalent of the Decoudun instrument now before us, this latter presents distinct advantages, not only as to convenience in use, but as to lightness and portability; the Decoudun photometer now before us weighing only 80 grammes (say three ounces), while we find that the Warnerke instrument, when denuded of the parts not required, weighs close upon 400 grammes (say 14 ounces).

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* See p. 769 of last week's News.

The last point raised by Storey and Roper—allowing a minute to elapse before making the final observation—is of some importance, but the minute under the focussing cloth may be reduced considerably by keeping the eyes nearly shut for about the same time before making the observation; a proceeding which is more satisfactory when there are bystanders about, as then a person whose head is long under the focussing cloth is liable to become the aim of more or less unpleasant practical jokes.

DOWNES *V.* FALLOWFIELD.

This case, which was referred to an Arbitrator as far as the question of fact whether the defendant's mounts caused the injury complained of, came on for hearing before the Arbitrator, Professor Frankland, on Thursday, the 8th instant, in one of the Arbitration Rooms of the Incorporated Law Society in Chancery Lane.

Before the proceedings commenced the defendant through his Counsel stated that a "garbled" report of the proceedings in the Queen's Bench Court had appeared in the Photographic News, and requested the Arbitrator to forbid any newspaper reporter to take notes for publication; the plaintiff being at the same time desirous for the reporter to remain.

The Arbitrator decided that as one side objected, our reporter must not take notes for publication.

We personally challenged, and once more challenge, the defendent to show that our report was in any respect "garbled," and expressed regret that he should have placed any obstacle in the way of making the details of this important case public. At the same time we expressed a hope that he would consent to the publication of the verbatim report made by the official shorthand writer on his behalf at the arbitration, and we hope some arrangement of this kind may be made.

GELATINO-CHLORIDE PLATES FOR PRINTING OUT.

W. H. Prestwich has shown us some prints on opal which he tells us are done by a gelatino-chloride printing out method, and they recall some of the very excellent examples of this class of work done by W. M. Ashman about four years ago. Ashman fully describes his process in a series of articles on "Positives on Gelatino-Chloride," which he wrote in conjunction with R. Offord, and the first of which appeared on page 52 of our volume for 1885. These papers have now become classic, and it surprises us that photographers have not already largely adopted the process into their everyday work. The following is an early formula of Ashman and Offord, and yields excellent results; in fact, the very best example of printing out on opal in gelatino-chloride which we remember to have seen was done by it. We quote from a leading article on page 161 of our issue for 1884.

"For a small quantity we take eighty grains of hard gelatine, and dissolve it by gentle heat in one and a-half ounces of distilled water; into this we pour a warm solution of silver nitrate, seventy-five grains in half-an-ounce of distilled water. We have previously taken the precaution of well drying a little sodium chloride and a little potassium citrate, and of each of these salts we take twenty-one grains, and mix them in half-an-ounce of water, dissolving by heat. This mixture we pour gradually into the warm gelatine and silver, stirring all the time, and then pour out the emulsion thus made into a small dish to set.

"We prefer working in yellow light at this point and onwards, though a distant gas-light is no doubt harmless in such a process. When the emulsion is set, we take a basin of water and a piece of mosquito net, and squeeze the jelly through the latter into the water, keeping the hands below the surface, because this emulsion is much more easily melted by the heat of the hands than a firm gelatine bromide. After five minutes, with an occasional stir, the water is poured off, and the basin filled up again. In another five minutes the water is again poured off, and the emulsion is thrown on to muslin stretched over some vessel, and allowed to drain for half-an-hour, when it can be melted up at a low temperature. Two drachms of alcohol must be added, in which three grains of salicylic acid are dissolved, and one grain of chrome alum dissolved in a little water by heat. Upon filtering it through some fine material, such as two folds of cambric, the emulsion is ready for coating the plates.

"When necessary, the thickness of coating can be regulated to suit the negatives, a hard negative requiring very little emulsion, and a very soft one a thicker coating. As a rule, less is required than with bromide for negative work. Upon a plain opal glass, polished with whitening, the emulsion flows as easily as collodion, but when using the before-mentioned substratum, a glass rod will be required to distribute it evenly over the plate. We have found the side of a clean little finger the most useful, and harmless, for the purpose, It is better not to pour off the plate into the coating jar, as air-bubbles are very readily formed by this mixture, and spoil the work. Either pour off into another cup, or put only just the right quantity on. Dust is a great enemy at this stage, and must be provided against by covering the top of levelling slap, and three sides. During drying also, to avoid dust, we prefer adopting the plan suggested in one of the Year Books, and placing the plates at the sides of an upright box, resting them against two nails, with one corner down, and the top corner hanging over to protect surface."

HOW TO MAKE A CAMERA BELLOWS.*

In manufacturing photographic apparatus on a large scale, as is now necessary to meet the rapidly increasing demands of the amateur and professional photographer, very little care is taken by some manufacturers to critically test the light-light qualities of each camera and bellows. Hence it happens that the purchaser sometimes finds, after careful trial, that he has obtained a faulty instrument, which, in these days of quick plates, is especially aggravating. A tight bellows is the most important feature about a modern camera, and it will be the purpose of this article to describe how one can be easily made. Leather, in some countries, is preferred to any other material, but the inferior qualities frequently used for the purpose are affected by moisture and become brittle, and will break at the corners in a short time. Rubber-coated cloth is largely used, on account of its imperviousness to moisture, but has the disadvantage of softening and sticking in a prolonged heat, particularly when the air is very humid, as it sometimes is in the United States, which results in the formation of minute interstices in the cloth support, through which the light will leak. Besides this, it is heavy, and will break at the corners.

Mr. Edward Bierstadt, of this city, formerly an amateur photographer, noticing the several weak points in camera bellows, concluded to try paper as a substitute for the above named materials, which proved to be so satisfactory after ten years' use that he has now adopted it exclusively. For large sized bellows a heavy grade of the best calendered Manilla paper is advised, since it is tough and pliable; but for small cameras a Japanese paper, commonly called "Japanese leatherette," should be used, as it is remarkably tough, and is a perfect imitation of leather.

By using black paper the blackening of the inside of the bellows may be omitted.

Two forms of bellows, either straight or conical, as to their length, may be made, but that of the straight shape is the easiest to make, which we will first describe.

It is advisable that a model of the bellows be first planned out on a thin sheet of paper, then creased and folded, in order that one may become familiar with the peculiarities of the folds, and the way of folding.

In calculating the size of the sheet required for a given length of bellows, allowance must be made for the extra length taken up by the folds. If a bellows is to be constructed for a camera adapted for 5 by 8 pictures, and it is desired that it have a stretch of fifteen inches, a sheet of paper 29 inches long by 15 inches wide should be selected. For this purpose we recommend a black leatherette paper, to be had from manufacturers of book binders' materials.

A yellow pencil should be used, so that its mark may be easily traced on the black paper, and a sheet of transfer paper, with one side rubbed over with chalk, as large as the bellows sheet, should also be provided.

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* Reprinted from the *Scientific American.*

The principal points to be observed in planning the bellows is to calculate where the outside and inside folds will come, and what portions of such folds are to be creased from the inside and outside.

To ascertain these several positions on a flat piece of paper and properly locate them, so that the folds will all come together in unison when the bellows is formed, is the problem one has to first study.

Diagram A illustrates the method of outlining the sheet with measurements for a 5 by 8 bellows. The sheet, being bent around in the direction of its length to form the bellows, requires that the lines representing the four angles of the bellows be drawn at right angles to the line of the folds, or parallel with the shortest length of the sheet. Two parallel lines are first drawn, 8½ inches apart, equally distant from the centre of the sheet, at right angles to its longest length. Then 5½ inches equidistant on the outer side of these lines two other parallel lines.

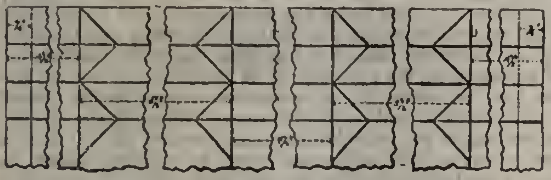


Diagram A.– Measurements for a 5 by 8 Bellows.

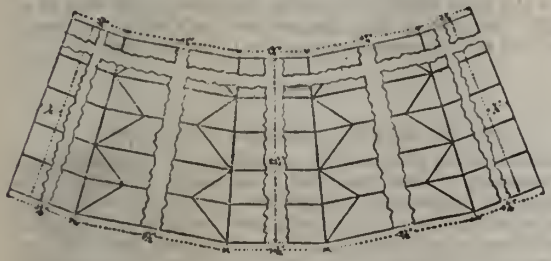


Diagram B.—Plan and Measurements for an 8 by 10 Bellows.

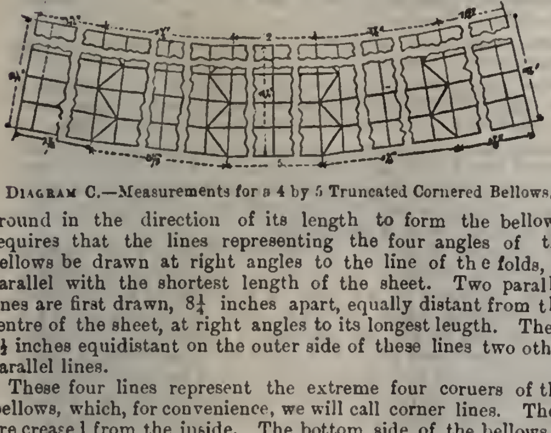


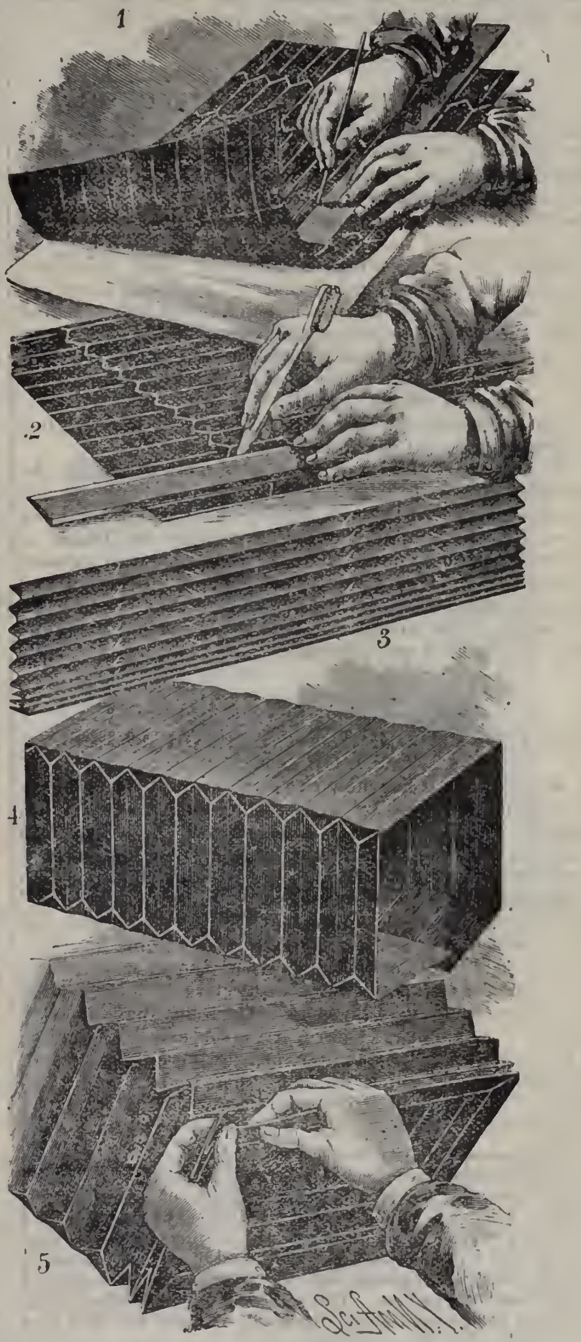
Diagram C.—Measurements for a 4 by 5 Truncated Cornered Bellows.

These four lines represent the extreme four corners of the bellows, which, for convenience, we will call corner lines. They are creased from the inside. The bottom side of the bellows is divided, and an allowance is made for the lap. As the width of each side of a fold of the bellows is to be ¾ of an inch, we next proceed to draw parallel lines, ¾ of an inch apart, across the longest length of the sheet, as shown by the heavy lines in the diagram, commencing ¾ of an inch from the edge. These represent where each fold is to be made, which we will term fold lines.

To find where the corner folds are to come, we next draw four lines, parallel with the first four corner lines, two of which are ¾ of an inch distant from the outside of the two centre corner lines, and the other two ¾ of inch distant inside of the two outer corner lines. When so drawn, we have a series of ¾ inch squares made with respect to the corner lines and fold lines, the squares lying toward each other, on each side of the corner lines. Starting from the edge of the sheet, we now intersect each square with a diagonal line, carrying it outward from the two centre corner lines and inward from the two outer corner lines. In the second square the reverse direction is taken. Thus we find the proper location of the corner folds by intersecting all the squares.

Having laid out the location of the folds, the next step is to ascertain which lines are to be creased from the outside and which from the inside of the bellows. Those to be creased from the inside are indicated by open or double lines in the diagram, while the heavy lines are to be creased from the outside.

Fig. 1 in the large engraving shows the manner of transferring the lines to be creased on the inside to the underside of the black sheet. The latter is laid upon a sheet of chalked paper, and with a rule and metal point the double lines drawn on the upper side of the sheet are run over. The pressure of the point is sufficient to leave a distinct white line on the under side of the sheet.



Figs. 1 to 5.—Creasing and Folding the Bellows.

Fig. 2 illustrates the way the lines are creased, which may be done by drawing and pressing the point of a tooth-brush handle or a carpenter's square lubricated with paraffin wax over the lines. First the side intended to form the outside of the bellows is creased, then the other side.

The sheet is folded up, after creasing as shown in Fig. 3, and tightly compressed, which gives the folds a definite, fixed form. The sheet is next drawn out flat and folded transversely to its length at the four corner lines, as shown in fig. 4, and the lap of a quarter of an inch at the bottom is cemented by glue or mucilage. A simple way to glue the joint is to first secure one end of a long, flat stick in a vice, and then slide the bellows over it, allowing the lap to rest on the stick. A slight rubbing pressure on the paper will bring the previously glued surfaces into close contact, and make a permanent light-tight joint. When the joint is perfectly dry then the bellows is formed, as shown in fig. 5, by commencing at the corners, and gradually crumpling and bending in the creased portions, continuing the manipulation on each corner of each separate fold one at a time. It is surprising to notice how readily the folds harmonise in with each other, provided the sheet has been carefully creased. To render the bellows waterproof, it is varnished on the outside with two coats of shellac varnish. When secured to the front and rear frames of a camera box, we have a waterproof non-crackable bellows which is absolutely light-tight, tough, and capable of being very compactly folded up. If light-coloured paper is employed, the interior of the bellows should be blackened with a varnish composed of shellac and lamp black. If the shellac is dissolved in water, borax or ammonia must be added to make the shellac dissolve.

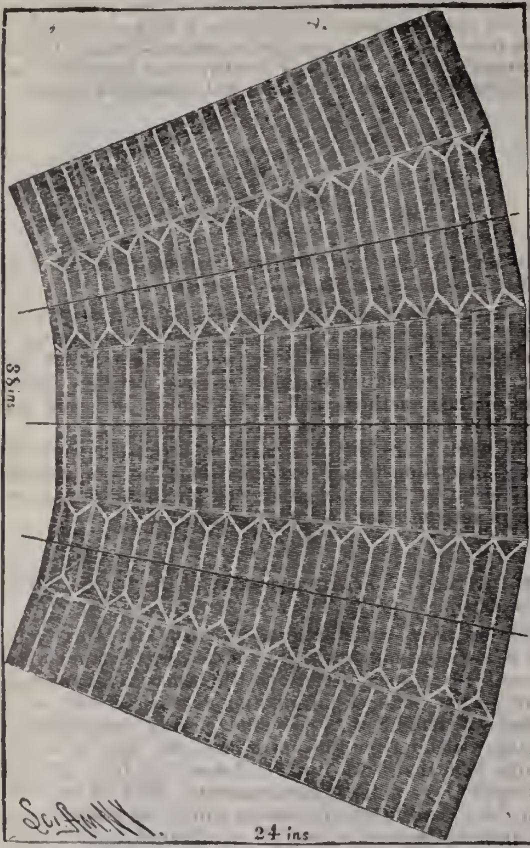


Fig. 6.—Plan of an 8 by 10 Truncated Pyramidal Bellows.

In making a truncated pyramidal shaped bellows, the plan of laying out the lines for creases and folds is quite similar to that previously described, with the exception that special compensation for the gradual tapering of the bellows has to be calculated for. The width of one-half of the folds is proportionately narrower than the other half.

In fig. 6 is seen the plan of an 8 by 10 bellows, in which the solid white lines represent the crease lines for the sunken folds on the outside of the bellows, and the double lines the crease lines for the under or inside folds. The size of sheet required is 24 by 38 inches.

We first draw a centre line in the direction of the length of the bellows, then, supposing the back of the bellows to measure 10½ inches, and the front end 6¾ inches in width, we lay off half of this measurement on each side of the centre line and connect the ends of the two front and back cross lines. These oblique lines form the two upper radial corner lines of the bellows.

Supposing the sides to measure 8½ inches wide on the back and 4¼ inches on the front or small end, we divide the distauce at each end and locate the side centre lines (see fig. 6). From these we determine the location, by measurement, of the two lower radial corner lines of the bellows. The bottom of the bellows is then divided, and one-half added to each side of the sides of the bellows, an extra length of ½ an inch being allowed for the lap or joint.

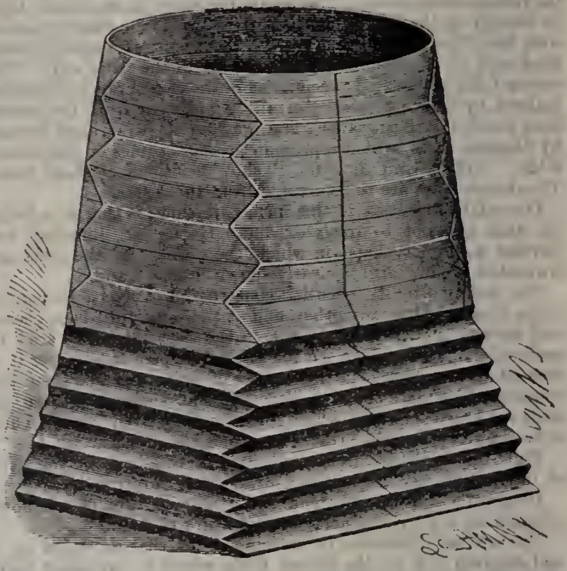


Fig. 7.—Truncated Cornered Pyramidal Bellows.

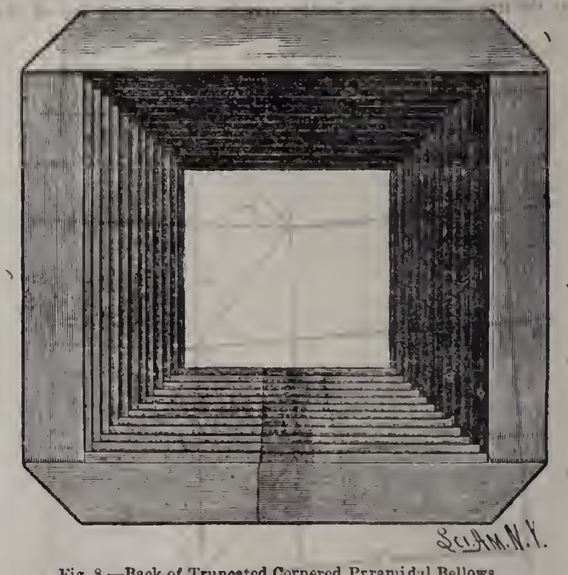


Fig. 8.—Back of Truncated Cornered Pyramidal Bellows.

The crease lines for the cross folds are next determined by first dividing off on the respective centre lines, in equal distances, the width of a double fold, which may be about 1½ inches. The measurement should commence from the wide end and proceed toward the small end. Cross-fold lines are then drawn between the four radial corner lines in each section, at right angles to their respective centre lines, and will meet each other, producing a shape similar to a portion of an octagon. The next step is to locate the position of the intermediate fold. This is done by laying the base of a draughtsman triangle on the base line, or back of line, and drawing a line at 45 degrees inward from the intersection of the corner line with the back line, nearly across the fold, then by reversing the position of the triangle, so that its base is coincident with the next fold line, and drawing another diagonal line at 45 degrees inward from the intersection of the fold line with the radial corner line to where it will cross the other diagonal line. Where they meet will be the proper location of the intermediate fold line. This will be the same for all the intermediate folds. The points for these lines should then be located on the centre line, and they should be drawn parallel with the other fold lines between the two centre corner lines. Each side of the bellows is measured off in the same way. The corner folds are located precisely as in the case of the rectangular bellows, by drawing lines ¾ of an inch distant from the corner lines parallel with the latter, and crossing the squares so formed by diagonal lines, which represent the zigzag lines of the corner folds. Fig. 6 and diagram B show positions of these lines. The double lines are to be creased from the inside.

One slight objection to this form of bellows is that it is liable to stick and not to freely expand. Hence Mr. Bierstadt has devised a simpler shape, in which the corners of the folds are truncated. This form is clearly shown in figs. 7 and 8.

The bellows, by its peculiar construction, may be folded up more compact than any other, and at the same time is so elastic and springy that its folds do not in the least adhere or stick to each other. In fig. 7 we see the conical shaped sheet after it is creased and cemented, in the process of being changed from the round to the square shape. After the flat sheet is creased, its ends are glued together, which forms a truncated cone. Then it is compressed at the creases into folds, as shown in fig. 5.

Fig. 8 shows the peculiar corner fold of this bellows, the joint at the bottom, and its compact form when compressed.

Diagram C shows the plan and measurements of a bellows adapted for a 4 by 5 camera, as shown in figs. 7 and 8.

The special difference in creasing from that shown in fig. 6 and diagram B is in the corner folds, which is explained more clearly by referring to diagram D.

Supposing the inside measure at the back to be 5 inches, and at the front 3 inches, we locate a centre line, C, and lay off the side corner line, D, as heretofore stated. We then divide the centre line into inches, and draw lines parallel to A, extending them on each side as far as side line W. We next determine the position of the intermediate line, I, by deducting from half the distance between E and A the amount of space between G and H, obtained by dropping a line from the intersection of fold line, E, with corner line, D, to the base line, A, the said line, E F, being parallel with the centre line, C. Just here is an important difference. Instead of stopping the intermediate line, at the corner line D, we extend it to point J, or a distance beyond the perpendicular line I F, equivalent to the space between I and F or between E and I. We then draw the line, J, parallel with corner line D, and have a guide where to draw the zigzag line, since the intermediate lines like I extend to line J, and the inner fold lines, like A and E, to line D. By drawing a diagonal line from H to J, across the square, K, and from J to E across the square L, we have the proper location and angle for the corner crease lines. From the point H, we measure off half of the width of the inside of the intended side of the bellows. Draw a centre line perpendicular to its base, and measure off on that the position of the fold lines as described for the top of the bellows. It will be seen that on the sides of the bellows the intermediate lines stop at line J, while the other fold lines cross the line J, and meet at E. By this method a curious skew shape of the cross lines, especially between lines D and J, is observed, but is necessary in order that the folds may come out in unison.

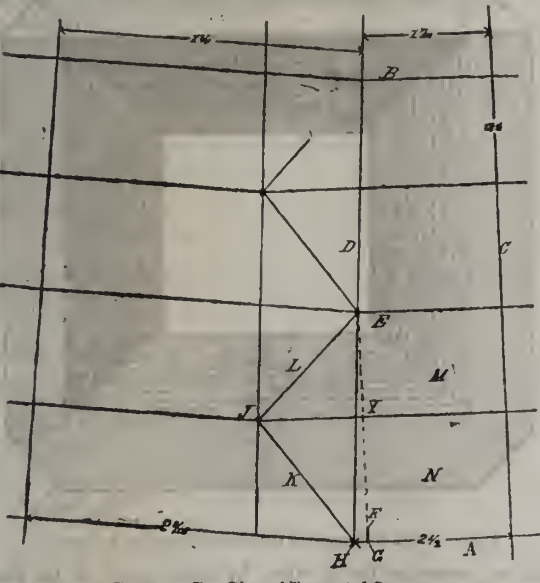


Diagram D.—Plan of Truncated Corners.

A bellows constructed after the above plan presents a very neat and light appearance. It requires a little more paper, but is, by reason of its elastic qualities, almost self-acting. It should be remembered that the use of dividers must be avoided, since the slightest puncture in the paper will damage the bellows.

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Reviews.

Photography Simplified. Third Edition. (*London*, 1887: *Mawson and Swan*, 33, *Soho Square*.)

We have here a capital handbook of everyday work, which extends to over 150 pages, and contains hints on apparatus, negative making by wet collodion, dry collodion, and the gelatino-bromide process, printing by the more common methods, and short chapters on some other matters of general interest to photographers.

The work bears distinct marks of being the work of a skilled practitioner, and it is one which we can cordially recommend as an instruction book for the beginner, or a book of reference for one more expert.

The Lantern. Christmas number of the *Cyclist*. Price one shilling. (*Iliffe*, 98, *Fleet Street*, *London*.)

Here we have something more than a Christmas number, as ordinarily understood; for, besides the story-telling element, humorous illustrations, Christmas songs and jokes, there is a fund of such information as cyclists may be expected to delight in. We find a very comprehensive Racing Calendar for 1887, of which we may give as a sample item that "Snook, J. C.," was "1st from 50 yards in bicycle three miles at Bournemouth, 30th May; time, 10m. 14s.," a piece of information which, we confess, we do not quite understand in its full significance, but it so excites our curiosity, that we look in another set of pages headed "Who's who in Cycling," to see if we can learn more about Mr. Snook; the result being that we find him to be a "genial captain" who has raced on no less than seventy-seven occasions. Indeed, we take it that the racing calendar and the biographical departments must represent an immense amount of labour on the part of the editor, and labour which the cycling fraternity are not likely to be slow in appreciating. Again, the long list of clubs shows what a hold cycling has taken upon this generation.

The connecting element of the book is a cyclist's lantern exhibition; the slides shown serving to introduce the stories and incidents, making the whole, as we take it, a very complete commentary on the cycling events of the year; and the work winds up with a capital article by Sturmey on "Instantaneous Photography for Cyclists."

FLASH-LIGHT PHOTOGRAPHY.

BY JOHN CARBUTT.*

I TAKE pleasure in bringing to your attention this evening the latest thing in instantaneous photography at night; although it is not instantaneous, for the duration of the flash is perceptible. It was but recently brought to the notice of the public at the meeting of the Photographic Society, in New York, on Tuesday last. Being a member of that society, I was so far interested in the subject as to go over to see its performance, and was very much struck by it.

While at first I thought the method would be useful only for social entertainment, I can now see where it might be of use in scientific investigations in photographing the interior of mines, geological strata, breasts of coal, or in any place where it might be of advantage to have a photographic representation of objects which could not be reached by daylight.

The invention is the outcome of investigations made by Dr. H. G. Piffard, of New York, who, on reading a description of a patented method of quickly igniting magnesium powder, the invention of a German, and patented in England, saw that the material used was of what he considered a dangerous nature, and that it would deter those unacquainted with chemistry from using it. He thought first of using gunpowder to ignite the magnesium powder, but finally decided upon gun-cotton, using the kind which is least explosive in its nature, the variety called collodion, which is not so rapidly explosive as that used for projectiles. The results of his investigations were so satisfactory that, having a little party at my house last week on the occasion of my daughter's birthday, I thought that before they broke up, I would endeavour to secure a picture of them by the new method; it would be a most interesting memento of the occasion, and might be followed by others for a more useful purpose.

Before showing you this light, I will show you some instantaneous pictures, which I took at the University last week of the young athletes in the act of vaulting, and while the pictures are upon the screen I will endeavour to demonstrate the rapidity with which the exposures were made. The first shows the first step made by the champion high jumper, Mr. Page, as he makes his spring before taking the jump.

The second is the five-feet jump. You see him just over the bar. Those who saw this performance will recognize that he turns around and faces the goal from which he starts.

The third is the five-feet-six jump, in which you see that his body is on the turn. The fourth is a representation of the extraordinary feat of Page breaking his own record by jumping six feet four inches.

The fifth represents Tom Ray vaulting with a pole and clearing the bar at eleven feet four inches. The sixth is the eleven-feet-six jump. In this jump, you will notice that after he rises to about the height of the pole, he climbs up it, hand-over-hand, about three hands, and elevates his feet over the pole and holds on with his left hand until he gets his feet clear, and then throws himself forward and the pole backward, using the momemtum to pitch his body over the bar.

This last picture is the group of children, the little party at our house, which we called our "Donkey Party;" it was taken by the flash which will be presently illustrated to you.

It will be readily seen how portable the photographic apparatus is. The apparatus now provided is of such a portable nature that wherever anybody can go with his body he can take it along. I have in my hand six charges. If the President will kindly sit for a moment, I will photograph him.

I have here an extemporized arrangement upon which to burn the magnesium. Here in this paper are twenty grains of pyroxyline, commonly called gun-cotton, and here is a piece of asbestos underneath. I scatter fifteen grains of magnesium powder on the gun-cotton, and by touching the gun-cotton with a lighted taper it will explode with a puff and ignite the magnesium-powder. All being now in readiness, I will put out the light.

I will endeavour to show you the results at the next meeting; there are no facilities here for developing.

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PHOTO-MICROGRAPHY.

BY T. CHARTERS WHITE.†

PHOTO-MICROGRAPHY is the art of making enlarged pictures of microscopic subjects by the aid of photography—the term microphotograph being confined to such small photographs as need a microscope to render them visible in all their details. Photomicrography may be regarded as taking over some of the work usually performed by the camera lucida, or any other appliance by which minute detail as seen through a microscope may be delineated. Many workers prefer the camera lucida for this purpose instead of employing the photographic process, and while the disadvantages and difficulties of both are well known, all must acknowledge that none are so physically immense as in that of photographing the subject of many microscopical preparations. Amongst the greatest obstacles to the photographic delineation of microscopical detail is that arising from the varying planes of a subject possessing any thickness. This is not of much consequence in ordinary microscopical examination, as by practice and focussing up and down the varying planes presented to the eye of the observer can be justly estimated in regard to their sequential relations, and in making a drawing of them with the camera lucida these can be brought into harmonious combination, and a fairly representative picture produced. Not so with photo-micrographic delineation, it is candidly confessed that by this process only the front plane of the object can be reproduced in accurate sharpness, each succeeding plane increasing in want of definition till the rest are lost in one entire blurr. This being true of even the very thinnest objects, it follows that the thicker the subject the greater will be the difficulty of obtaining any delineation worth looking at, to say nothing of its capability of conveying a correct impression of its nature and true character. Under these conditions only the camera lucida and the trained eye and hand of a skilful draughtsman can suffice to render an adequate representation.

These difficulties arise from physical causes, and will be found connected in a greater or less degree with all microscopical objectives alike, the only mitigation being afforded by using low-power glasses, so that provided the front plane of an object seen through one of these is sharply defined, there is not much falling off in the definition of several of the succeeding planes, certainly not sufficient to be offensive to the eye, but it gradually increases till the inevitable blurr occupies the most posterior. These phenomena, which the lowness of the power enables us to detect and follow with facility, occur sooner in the higher powers, so much so that that plane behind the front immediately shows a falling off in definition, and the succeeding planes rapidly degenerate in indistinctness. This obstacle may to a great extent be minimised by employing the penetrability of the low powers and getting amplification by increasing the distance between the object and the sensitive plate. This method, however, must of necessity be limited in its applicability. This art has been practised by many, both in this country and on the Continent, since photography was first discovered, and considering the advances made in optical science it is discouraging to see how appreciably small is the progress towards perfection as displayed in the photo-micrographic examples exhibited. I should like to see other objects than Echinus spines and sections of wood and such like worked up—these are comparatively easy to do; but I hope that when this branch of photographic science captivates by its fascination a few more enthusiasts that an advance may be made all along the line.

The apparatus employed for the purpose of obtaining photomicrographs has varied slightly in outward detail, and a reference to the journal of the Royal Microscopical Society for June 1887 will show by illustrations the various instruments favoured by different workers. Some employ the eye-piece, and other's don't. Those using the eye-piece may get sharpness over a very circumscribed disc, but I favour the instrument without the eye-piece; as for my class of work I don't wish to be limited to size, for in exhibiting pathological and anatomical subjects it is desirable to show as much as possible of the relationship of the different parts. If you wish to confine yourself to such small and complete subjects as diatoms or bacteria taken with the highest known powers, then it is not of much consequence to do more than photograph a small portion of your subject, just sufficient to show the character of the detail, when the eye-piece may be an advantage; but if your fancy lies in the direction of photographing whole insects on large sections of a histological character, then the eyepiece becomes a hindrance and is better dispensed with. This being the principle upon which I have worked I may now call your attention to the construction of the apparatus you see before you, which has enabled me to do fairly good work without much difficulty.

Those of you who have on former occasions seen the apparatus I devised for my first work, will now see that I have modified it in one respect, but in one only. You may remember in the original arrangement I employed an objective, which, being screwed into a moveable brass plate, occupied somewhat of the position of a lens in an optical lantern, the object to be photographed being held in a vertical moveable stage which was capable of being actuated in focusing by a long micrometer screw; this, together with my oil lamp, included in an oblong lidless box placed on its side, constituted the home-made but very efficient camera. By means of this arrangement images of microscopic objects could be projected on to a card and made available for purposes of instruction or for drawing diagrams, and, of course, upon a small scale, the image projected on to a sensitive plate could be photographed. I did very satisfactory work with this form of camera, as the album on the table can testify to; but I needed some further elaboration in the direction of condensing and centreing the light when using powers higher than one-fifth of an inch. About that time I was in communication with my friend Mr. Walmsley, of Philadelphia, who kindly sent me this photograph of the arrangement he employed. I saw its applicability to my want, and Messrs. Beck, who had made this for him, made one for me, being about the third of this character made by them. I have substituted this for my former apparatus of vertical stage and objective, retaining every other feature of the deal box and sliding base board, and I find it works with the greatest comfort and satisfaction to me—being steady and free from vibration, giving plenty of light with every provision for modifying it where desirable. With this short introduction to an old friend which has lately put on a modified face, I will pass on to a brief sketch of the light employed, and say a few words on focusing and exposure.

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* Substance of Remarks at Meeting of American Institute.

† A communication to the North London Photographic Society.

The light employed by me is from a microscopical lamp known as Bochett's—this is more than is sufficient for all powers up to one-fifth of an inch; above that it would be desirable to have one more powerful, but so arranged as to be capable of modification, because detail and sharpness is greatly depreciated by too much light. The oil I employ is a paraffine known as Strange's crystal oil, in which I place a piece of camphor about the size of an ordinary Spanish nut to the reservoirful of paraffine; this dissolves readily, and imparts a more actinic colour to the light. I find in practice that a larger quantity is unnecessary, besides soon coating the inside of the chimney with a yellow deposit; it is always advisable before commencing work to wipe out the chimney with a cloth moistened with spirits of wine so as to remove this deposit, and under all circumstances to start fair each night under the same conditions, because any variation in these might throw you out in your judgment of the right exposures. A plano-convex condensing lens is necessary, and should always be used with the plane side towards the object to be photographed, so as to render the light rays parallel. The lamp should be lighted and placed in the apparatus for about five minutes before beginning operations, that every part may be warmed up and subsequent expansion of the brass work be moderated, if not checked altogether.

(*To be continued.*)

Notes.

The President of the Photographic Society certainly can exercise a wondrous power over the members. On Tuesday last, after the meeting had voted that the minutes of the last ordinary meeting were not to be taken as correct, the members turned to the right about, and voted the other way after the President had threatened to leave the chair and never re-enter it unless they accepted the minutes; in fact, he did leave the chair, and nearly reached the door. Which vote is to be taken as correct, may be asked; that which confirmed the minutes of the previous meeting, or that which rejected them?

Runge, speaking at the Berlin Photographic Society, said that old engravings are now so perfectly imitated by heliogravure that even experienced judges are deceived.

The intensification of platinotype prints is done in the following manner by E. Vogel, junior. The print, which has been developed in the usual way and treated with dilute hydrochloric acid, is flooded with the following solution:—Normal chloro-platinite of potassium solution (1 to 6), three to five drops; water, 50 cubic centimetres; oxalate developer, 5 c.c. The platinum soon becomes reduced and attaches itself to the image on the prints, but afterwards the solution becomes deep black. The superfluous intensifier is put away in a bottle, where it deposits the whole of its platinum, after which the clear liquor can be poured away.

The sentimental Germans go a little further than we do in their admiration of their public favourites. It is a common practice to publish photographs of celebrities having inscribed beneath them a title expressive of the picture. The latest instance is the photograph of a group of royalties, which has just come out in Berlin under the title of "The Happiness of the Hohenzollerns," and represents the Emperor seated in the midst of his grandchildren and great-grandchildren, and other members of his family. It has been remarked that this photograph, like many other photographs of the German Imperial family, contains no representation of the Crown Prince, who, says one writer, "has in late photographs been either missing from the group, or thrust into the remote background." The occurrence, no doubt, is purely accidental, but that it should have excited comment shows that now-a-days, in "the fierce light which beats about a throne," must be reckoned the light of the photographic studio.

If what a Society paper says is true, photographs were the means of introducing Charles Dickens to the Queen. Dickens, for some reason which has never been explained, always had a reluctance to meet her Majesty, and on three occasions he contrived to avoid the interview. Probably this persistent disinclination stimulated the curiosity of the Queen, and she adopted a method which, we suppose in other people, would be called a ruse to bring about the meeting. As a lead, her Majesty first desired to see some American photographs collected by Dickens during his tour in the States, and then stated she wished to thank him personally. In this way the interview was arranged, thanks to photography.

As no one expected his election to the Presidency less than M. Carnot himself, his photograph has not yet taken its place by side of those of other celebrities in the shop windows. Indeed, it is whispered that the new president is rather averse to the publicity which photography gives nowadays. Perhaps this accounts for the jesting statement in the *Gaulois*, that he has been sending round his photograph to several prominent persons, accompanied by a suitable inscription:—"To M. Jules Grevy—As a souvenir of the excellent condition in which I find the Elysée." "To M. Wilson—With my best thanks." "To M. Freycinet—For his surrender of the 3rd of December." "To M. Ferry—My condolences." "To Louise Michel—Carnot for everybody—Sadi for you."

We alluded a few weeks ago to the use of photography by gold mining companies. This use is gradually extending, and though photographs have not yet made their appearance at companies' meetings, they are to be seen at their offices. One gold mining company is now exhibiting from thirty to forty large photographs which have been taken of the mines in Colorado, and no doubt the shareholders find much satisfaction at gazing at the pictures of the land which is to make their fortunes. But if these photographs were only in natural colours! This is what really is wanted. The photograph of a nugget might as well be the photograph of a lump of coal for any idea of value that it conveys to the mind. On the other hand, could the colour of the precious metal, as it is seen after the auriferous gravel is "panned," or after the quartz is milled, be conveyed, there would be, to use the words of the conjuror, "no deception." In the interests of Gold Mining Companies the sooner somebody re-discovers the secret which has been "discovered" so often the better. The companies would pay well for the discovery.

It is difficult to draw a landscape from a photograph and put it forward as drawn from nature. The *Athenæum* in reviewing a guide book to Paris, most of the illustrations in which the author says are done from his own sketches, remarks, "Judging from the revelations of perspective and from our knowledge of the photographs of Paris and its outskirts, we fear that we must pronounce a larger portion of them to be obviously from photographs than Mr. ——— is willing to admit." Perspective is an awkward element to tackle, and it is not, as a rule, the artist's—especially when he is an amateur—strong point. One would like to know whether the Athenæum's *acumen* found out that the perspective was too good or too bad, and if the latter, whether from a photograph of buildings taken with a short focus lens, or with a camera not provided with a swing back.

A new scientific toy is suggested by an experiment made by M. Marey in connection with his photographic investigations in relation to the flight of birds, to which we alluded some time ago. He placed the solid figures of birds in various gradations of flight based upon his photographs within a zoetrope, which, upon revolving, gave to the spectator an exact idea of aerial motion. As he remarks, the movements of the wings, which in nature are extremely rapid, and in consequence difficult to seize, are here greatly lessened in speed, so that one can easily follow the phases, and secure what the most careful observation of actual flight is unable to do. A detailed account of this and other interesting experiments relating to the flight of gulls, herons, pigeons, and pelicans appears in *La Nature* for Dec. 3. M. Marey, we need not say, has not devised his zoetrope expressly for amusement's sake, but it seems very well adapted for this purpose.

A newly-published volume on "Athletics" contains a multitude of admirable illustrations of football, running, leaping, &c., some of which are obviously from instantaneous photographs. The remainder seem to suggest the commencement of a new era in figure drawing. The artist evidently felt himself in a dilemma in the delineation of motion. He had the grotesque—at least, so they appear now to the eye—attitudes of instantaneous photography on the one hand, and the conventionalities of art on the other. It was impossible to mix up the two, and, consequently, unless we are very much mistaken, the artist has gone over to the photographer's view, and has drawn several of the pictures as he imagines an instantaneous photograph would give them. The result is rather confusing, especially as in no case is there any intimation beneath the picture that it is from a photograph or a sketch. If we are right in our surmise, the precedent would seem to be rather a dangerous one. Instantaneous photography is one thing; drawings in the style of instantaneous photography another. The omission to specify this distinction seriously mars an otherwise useful book.

Patent Intelligence.

Applications for Letters Patent.

17,017. **Frederick Thomas Jefferson**, 7, Staple Inn, Middlesex, for "A new or improved combined easel and suspender for supporting and suspending Christmas cards and other cards, photographs, and other like articles."—Dec. 10, 1887.

Official Abstracts of Accepted Complete Specifications.

2,042 of 1887. **Gotz**, for "Cameras [including lenses and lens fittings]": Camera back supported on ends of links attached to slides on edge of baseboard, curved racks and pinion for swing.

2,012 of 1887. **Sershall**, for "Printing, colouring, and finishing." Printed artificial sky applied by masking out landscape and stopping sky on negative.

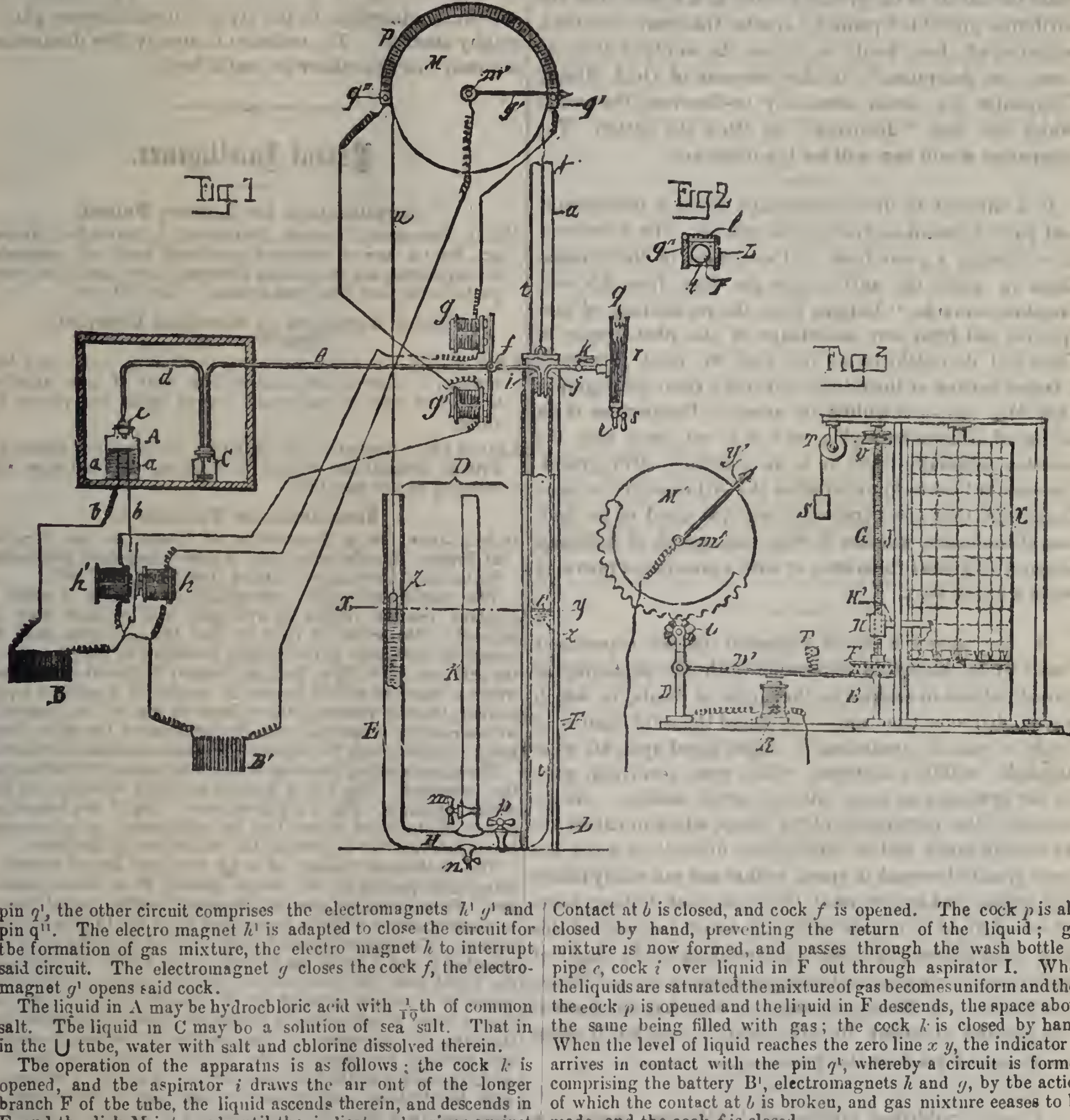
Specifications Published.

14,518. **Jean Emile Dessendier**, of Roanne, in the Republic of France, Manufacturers, for "A new or improved photometer for use in photography."—Dated 10th November, 1887.

The photometer consists essentially of a device in which a constant relative volume of hydrogen and chlorine may be exposed to the action of light, so that the said gases may be caused to unite more or less quickly according to the intensity of the actinism of the light, forming thereby hydrochloric acid gas which is dissolved as it is formed by means of a suitable liquid solvent, thereby reducing the volume of gas in the receptacle with a rapidity proportionate to the actinism of the light, there being suitable means for indicating the said decrease of volume.

The accompanying drawings illustrate apparatus for performing the invention. Fig. 1 is a vertical sectional elevation of the whole apparatus. Fig. 2 is a detail view. Fig. 3 is a recording device adapted to be operated by the photometer or actinometer herein described for registering the movements of the latter.

The photometer consists of a U tube, the longer branch F being in proportion to the shorter branch E as about three to two. From between these two branches rises the central tube K in communication with the lower bend H of the U tube through cock *m*. The longer branch F is also divided from the other two branches E and K by means of cock *p*. *n* is a cock for emptying the liquid from the photometer. The longer arm F is closed above by a stopper through which pass two tubes *i* and *j*, the former being in connection with the gas forming apparatus, and the latter in connection with an aspirator or bellows I operated by a spring *q* for emptying the gas or air from the branch F when the cock *k* in the tube *j* is opened—*s* is a cock in connection with the bellows, communicating with pipe *r*, which may be continued away from the apparatus into a solution of potash or lime for preventing the emission of gases, since the same would be liable to destroy the apparatus by attacking the metallic parts thereof. The tubes E K F are blackened or encased up to the level of the line *x y*, the same being the zero of the instrument, the U tube being filled with liquid to this level through the tube K; the longer branch F of the U tube is enclosed in a casing L having a sliding cover t (fig. 2) with a horizontal slit t^1 therein, the said slit being in such a position as to illumine the interior of the branch F just above the level of the liquid therein The cover t slides without friction, and is connected to a cord u passing over the disk or pulley M, and connected to a float z counter-balancing the cover, and supported by the liquid in the arm E of the U tube—The disk M is preferably of such diameter that half the circumference of the disk is equal to the distance from the "zero" to the summit of the longer branch of the U tube less about one centimeter. The disk M is pivoted at m^1 as freely as possible from friction, and to the disk is secured the indicator y^1 radially arranged, thereon. Behind the disk is the dial P suitably divided upon its periphery, and extending preferably about a half of the circumference of the disk. The dial P is stationary and carries the pins q^1 q^{11}, the purpose of which is hereinafter described.



Since the purity of the hydrogen and chlorine and the exact proportions of these are essential, the gases are preferably derived by electrolysis or electrical decomposition of hydrohloric acid. For this purpose the apparatus hereinafter described may be used.

A is a bottle or jar closed with stopper c, and having therein plates a a of porous carbon or other suitable material, the said plates being in connection with the poles of a battery, or source of electricity B by means of wires b b, there being in the circuit a contact breaker operated as hereinafter described. The jar A contains the hydrochloric acid to be decomposed, and it is placed in communication with a wash bottle C of known construction, from which the pipe e passes to the cock f, in communication with tube i before mentioned. The jars A and C and pipes d e i &c., are protected from light. B^1 is a battery or source of electricity in connection with two circuits adapted to be closed respectively by the contact of the indicator y^1 with the pins q^1 q^{11}. One circuit comprises the battery B^1, electro magnets h and g, and pin q^1, the other circuit comprises the electromagnets h^1 g^1 and pin q^{11}. The electro magnet h^1 is adapted to close the circuit for the formation of gas mixture, the electro magnet h to interrupt said circuit. The electromagnet g closes the cock f, the electromagnet g^1 opens said cock.

The liquid in A may be hydrochloric acid with $\frac{1}{10}$th of common salt. The liquid in C may be a solution of sea salt. That in in the U tube, water with salt and chlorine dissolved therein.

The operation of the apparatus is as follows: the cock k is opened, and the aspirator i draws the air out of the longer branch F of the tube, the liquid ascends therein, and descends in E, and the disk M is turned until the indicator y^1 arrives against the pin q^{11}, when the liquid will have risen to within a centimeter of the summit of the longer branch of the U tube. By this means a current is produced between the battery B^1, electro-magnets h^1 g^1, and pin q^2 indicator y^1, and thence to the battery. Contact at b is closed, and cock f is opened. The cock p is also closed by hand, preventing the return of the liquid; gas mixture is now formed, and passes through the wash bottle C, pipe e, cock i over liquid in F out through aspirator I. When the liquids are saturated the mixture of gas becomes uniform and then the cock p is opened and the liquid in F descends, the space above the same being filled with gas; the cock k is closed by hand. When the level of liquid reaches the zero line x y, the indicator y^1 arrives in contact with the pin q^1, whereby a circuit is formed comprising the battery B^1, electromagnets h and g, by the action of which the contact at b is broken, and gas mixture ceases to be made, and the cock f is closed.

The apparatus being now exposed to the light to be tested, the light will illuminate always the same volume of gas mixture through the slit in the cover t, and the actinism of the light will cause the gas mixture so illuminated to be combined, more or less quickly, according to the strength of the light, and the hypochloric acid so formed will be dissolved by the liquid in the tube, the said liquid rising to replace the gas so absorbed.

The rapidity with which the liquid rises, that is to say of the movement of the indicator y^1 over the dial P, will therefore be a measure of the actinism of the light.

l is a door, and g^{11} a red glass screen, through which the tube F may be viewed if desired.

To enable the movement of the finger y^1 to be registered during a given time, the recording device illustrated in fig. 3 and hereinafter described may be employed.

X is a drum revolving once, say, in twenty-four hours, or in twelve hours. G is a screw spindle journaled parallel to said drum, and carrying, fixed to it at one end, the drum v, about which a cord is wound, passing over pully T, and terminating in weight S. F E is an escapement of any desired construction, the same being operated by momentary currents passing through the electromagnet R. The armature D^1 of said magnet is pivoted to the standard D and to the anchor E of the escapement. P is a spring tending to return said armature after attraction thereof by the magnet R; c is a wheel having ten teeth, five being electrical conductors, and five insulators; the pulley M is also provided with teeth gearing with wheel c. H^1 is a writing finger attached to the boss H on the spindle G; J is a rail guiding the finger H^1. As the disc M turns, contacts are made by the teeth thereof with those of the wheel c, whereby momentary currents pass at intervals through the coils of the electromagnet R, so that the armature thereof is attracted, and the escapement wheel permitted to be moved by the weight S, the spindle G is thus revolved, and the finger H^1 raised, making an inclined mark upon the drum X, the slope of which indicates the actinism of the light.

When the liquid in the tube F rises nearly to the summit thereof, the indicator y^1 arrives against the pin q^{11}, whereby the cock f is opened, and new gas mixture is supplied to the tube F until the zero is again reached, and the contact of the indicator y^1 with the pin q^1 causes the entrance of gas mixture to cease. The escapement F E may be such that the return movement of the disc M is without effect, thereon the rising of the finger H^1 is therefore never substantially arrested, since the return of the disc M is comparatively fast with regard to the motion of the drum X.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is.—

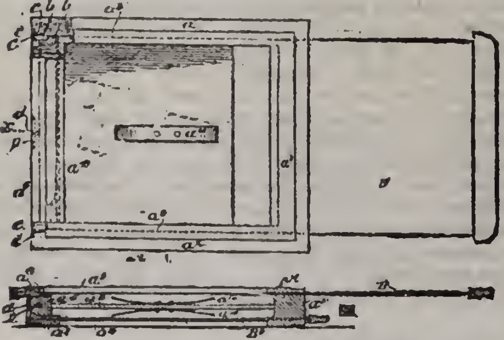
1. Producing a continuous movement proportional to the intensity of the light by aid of a mixture of chlorine and hydrogen in equal volumes, by means of a regulator maintaining a constant volume of the gaseous mixture exposed to the light.

2. The general arrangement described and shown in the annexed drawings for attaining this purpose.

Patents Granted in America.

373,231. WILLARD H. FULLER, Passaic, N.J., assignor to The Scovill Manufacturing Company, New York, N.Y., "Plate-holder for photographers."—Filed July 16th, 1887. Serial No. 244,488. (Model.)

Claim.—1. In a photographic plate-holder, the combination of fixed side pieces, a fixed end piece, a sliding end piece, and a stop for limiting the extent of outward movement of the sliding end piece, substantially as specified.

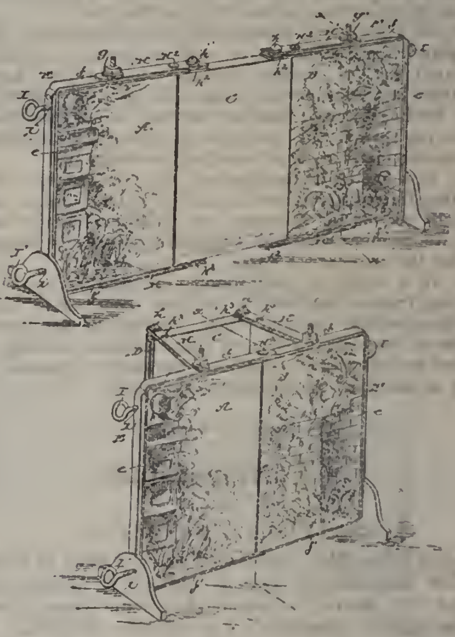


2. In a photographic plate-holder, the combination of fixed side pieces, a fixed end piece, a sliding end piece provided with shouldered tongues engaging with grooves in the side pieces, and a stop-bar for limiting the extent of outward movement of the sliding end piece, substantially as specified.

3. In a photographic plate-holder, the combination of fixed side pieces, a fixed end piece, a sliding end piece, a stop for limiting the extent of outward movement of the sliding end piece, and a lock for securing the sliding end piece in the position which it is intended normally to occupy, substantially as specified.

373,794. MATHIAS ARMBRUSTER, Columbus, Ohio, for "Photographer's scenery." Filed July 18, 1887. Serial No. 244,617. (No model.)

Claim—1. A photographer's background consisting of the adjustable frames and members or sections mounted in the said frames so that the vertical edges of the members abut together, subtantially as and for the purpose described.



2. A photographer's background consisting of adjustable frames connected together and members or sections mounted in and adjustable with the frames, said members abutting together at their contiguous vertical edges and pointed, so that the designs or scenes thereon match at the vertical edges of the members, substantially as and for the purpose described.

3. A photographer's background consisting of end members or sections, adjustable frames in which the end members are mounted, and an intermediate member adjustable in line with and between the end members, said intermediate member being also adjustable in rear of the end members and frames to adapt the two end members to abut together at their vertical edges, substantially as and for the purpose described.

4. A photograper's background comprising end members and an intermediate member connected by intermediate devices with the end members and adjustable in line with and between the same, substantially as and for the purpose specified.

5. In a photographer's background, the combination of the supporting-frames adjustably and detachably connected together, end members mounted in and adjustable with the frames, an intermediate member, and links connecting the intermediate member to the supporting-frames, whereby the supporting-frames and end members can be adjusted laterally of each other to have an intermediate space between the same, into which space the intermediate member or section is adjusted to lie in line with the end members, substantially as described.

6. A photographer's background consisting of suitable carrying-frames having the open contiguous sides and members or sections mounted in said frames and capable of lateral or edgewise movement therein to close the joint between the meeting edges of the sections, substantially as described.

7. A photographer's background consisting of carrying-frames, members, or sections mounted in the frames, and devices

connecting the members to the frames in such a manner as to permit the members to have a horizontal swinging movement around a vertical centre and a lateral edgewise movement toward one another, substantially as and for the purpose described.

8. In a sectional background, the combination of suitable carrying-frames adjustable relatively to each other, members adjustably mounted in the frames, and devices for moving the members laterally in the frames to close the joint between the members, substantially as described.

9. In a sectional background, the combination of suitable carrying-frames, members mounted in the frames and capable of lateral movement therein, spring devices for normally holding the frames in position to turn freely in the frames, and means for adjusting the sections or members against the tension of the spring devices substantially as described.

10. In a sectional background, the combination of suitable carrying-frames, members or sections having longitudinal slots mounted in the frames, springs for normally holding the members in the supporting-frames, so as to turn freely therein, and binding-screws working in the supporting-frames and impinging against the members to move the same laterally in the supporting-frames, substantially as described.

11. In a sectional background, the combination of suitable carrying-frames, members mounted in the frames, an intermediate section or member, and links connecting the intermediate member with the supporting-frames, substantially as and for the purpose set forth.

12. In a sectional background, the combination of suitable carrying-frames, members, or sections mounted in the frames, an intermediate section, links connecting the intermediate section to the carrying-frames, and devices for holding the links in fixed position with relation to the carrying-frames, substantially as described, for the purpose set forth.

Correspondence.

HYPO ELIMINATORS.

Dear Sir,—May I advise those who wish to experiment in this direction to try a solution of iodine, which Dr Vogel very warmly recommended some years ago? The iodine may be dissolved in a solution of iodide of potassium as strong as possible for a stock solution, and the treatment of the silver prints may conveniently be as follows:—After fixing as usual, wash in three or four changes of water, and then place them in water coloured by the iodine solution to about the tint of pale sherry, and replace this iodine water with fresh, as may be necessary, until the prints show a slight, but persistent, blue colour. This blue is especially visible on the back, and shows excess of iodine, and, therefore, absence of hypo. To get rid of the blue colour, rinse the prints in a solution of sulphite of soda and carbonate of soda, made very weak indeed (a few drops of a strong solution to a pint or quart of water), and then wash them in two or three changes of clean water and dry. The iodine solution must not be used in a metallic vessel.—I am, &c., Chapman Jones.

ORTHOCHROMATIC PHOTOGRAPHY.

Dear Sir,—Will you allow us to trespass on your space for a few words in reply to Mr. Bothamley's letter in your issue of December 2nd, and in explanation of our former letter in the News of November 25th?

Our reasonable excuse for supposing that Mr. Bothamley's papers were concluded must be the fact that he himself stated in the last paragraph of a previous article (Photographic News, page 568) that the one next following would form the conclusion of the series. We thereupon expressed our opinion that the papers were "singularly incomplete" for other reasons besides those which we have given. It would be easy to show that Mr. Bothamley's paper, as it now stands, is full of misleading statements and erroneous conclusions, as he, doubtless, will find when he becomes better acquainted with the subject. For instance, he is entirely mistaken as to the superiority of the bath process as used by him, which, at best, is only an imperfect and roundabout way of producing results which are better obtained by the use of an emulsion made isochromatic in the first instance.

All the experiments described by Mr. Bothamley are evidently based upon what is regarded by practical workers as the mistaken theory of so-called "optical sensitizers," in which the film which contains the sensitive silver compound is stained or dyed, so as to absorb certain rays of the spectrum. Throughout the description of his experiments constant reference is made to the results obtained on "dyed" or "undyed" plates, with no hint or suggestion that the "dye," as such, has little or nothing to do with the isochromatic effect—the latter being entirely due to the colour sensitive chemical compound formed between the ammoniacal solution of eosine (or erythrosin) and the silver bromide as first invented and used by Messrs. Tailfer and Clayton. Mr. Bothamley will probably be surprised to learn that this colour sensitive compound can be separated from the "dyed" or stained gelatine, and re-emulsified in fresh unstained gelatine without impairing its orthochromatic properties. In Tailfer's process the eosine is not used as a "dye," the word being never once mentioned in the specification; on the contrary, explicit instructions are given, by the use of alcohol with the eosine and ammonia, and subsequent washing, for the removal of all the eosine which has not become "immediately associated" with the silver bromide. We notice that this important part of the operations in the preparation of eosinated gelatine plates and emulsion has been entirely omitted by Mr. Bothamley in every instance, and we call his attention to this point as a valuable hint for his future experiments. It was the omission of all notice of this and other important matters, which are clearly indicated, which led us to the conclusion that Mr. Bothamley had curiously "misread or misinterpreted" the wording of the specification to which he again refers, and which, we again assure him, is in all essential points sufficiently clear and explicit, as he will find in actual practice. It is true that in the bath process no definite strength is given for the eosine solution. This is purposely left "entirely to the discretion of the operator." The proportion of eosine in a given quantity of solution may vary enormously (certainly to the extent of one hundred times the required quantity) without materially affecting the result. It is not true, as stated by Mr. Bothamley, that "success depends mainly upon the proper proportion."

There are many other errors in Mr. Bothamley's paper, which, if his work is to be of any value for future reference, should be corrected. It is, therefore, satisfactory to know that he has decided to continue his investigations, and that he has received a grant from the research fund of the Chemical Society for that purpose, notwithstanding that the subject has been fully worked out in more experienced if not in abler hands. The fact that (as already shown by his previous experiments) the only known process likely to give successful results is the subject of a patent in this country does not lessen its value as applied to science and art, and we have yet to learn that "it is usual" for a "scientific investigator" to ignore an invention relating to the subject because it happens to be patented, and to confine his attention to imitations of such invention, or to go out of his way to find fault with the specification because he does not understand it. "There are none so blind as those who will not see."—We are, yours very truly, B. J. Edwards & Co.

The Grove, Hackney, London.

STRIPPING FILMS PATENT.

Dear Sir,—Mr. Foxlee, in his reply to our correspondent, claims to be the "true and first inventor" of the methods described in his specification.

What our correspondent will have to say we shall have to wait to hear. As for ourselves, we have no desire to discuss the matter, but we should like to have an authoritative statement as to whether a set of operations, in no sense the inventions of Mr. Foxlee, but previously well known and practised in the production of positive and negative pictures developed upon, and afterwards stripped from glass, can become the patent right of any one who may choose to utilize them for the purpose of stripping negative films from paper.—We are, yours very truly,

The Autotype Company.

THE OPTICAL CENTRE OF A LENS.

Sir,—The "Birkbeck Lecture" (Chap. XV.), published in your last, is in some respects an interesting and valuable one. But still I fear that the recommendation, under such authority, of the "optical centre" of a lens as the point from which we ought in all cases (except some in which a point of admission and emission is suggested, the use and relevance of which to the subject is not made clear) to measure its focal length, may confirm some error and more misconception. It is well to remember that the centre of refractive action in a lens must often vary in position, according to the surface presented to incident rays—*i.e.*, whether the plain or convex surface of a plano-convex lens is so presented—as well as on the form of the incident pencil, whether divergent, parallel, or convergent, and can, therefore, only occasionally coincide with a fixed point like this "optical centre." Thus, if with a plano-convex lens, we turn the plane side to parallel incident rays, the refraction is confined to the convex surface, as in the plano-convex spectacle leus judiciously selected for a standard in the lecture referred to, and the centre of refractive action will then coincide with the point known as the "optical centre." But if the lens be turned the other way; or should the rays have considerable divergence or convergence—as will happen constantly, divergence when copying, and convergence when, having passed through a front lens, they entered the back lens of ordinary combinations—then the centre of refractive action will not in general coincide with the so-called "optical centre," but will be at some point within or else away from the lens. For instance, in a lens placed like the back lens of a Voightlander shown in Mr. Chapman Jones's fig. 33, it will be outside and away from the lens, though plano-convex; while, if used with the stop behind it, like the front lens of a doublet used by itself, the centre of refractive action would be inside the lens. And, supposing our calculation of focal lengths be intended to find the proper place for the stop in any temporary combination, so as properly to correct the distortion, we then have to substitute for the rays of an ordinary pencil the axes of the various excentrical pencils of rays. These axes will then constitute a pencil—highly convergent at incidence, and equally divergent at emergence. To both the incidence and emergence of such pencils the form of meniscus lenses, as ordinarilly placed, is extremely favourable; and, for the same reason that it is so, it will be found also that to such pencils the centre of refractive action is far from the optical centre"—there being no great contrast between the refractive action at the two surfaces respectively—so that it will probably be inside the lens, though a meniscus. On the other hand, the centre of convergent refractive action for ordinary pencils of rays passing through the back lens of a doublet combination will be at some distance beyond its posterior surface—the convergent action of that surface, considered by itself, being generally greater than the difference (or algebraic sum) of the combined actions of both surfaces.

In truth, this "optical centre" was primarily a mere mathematical contrivance for investigating the form of oblique centrical pencils (I should point out that the axes of excentrical pencils, almost exclusively used in photography, do not pass through the "optical centre"), and it is especially used in calculating the effect of thickness[*] (*t*) on the various corrections of achromatic and aplanatic objectives. It may often, under appropriate conditions, be found a convenient approximation to the centre of refractive action; but if accuracy be desired, and, still more, for the sake of correct ideas and an intelligent apprehension of the conditions involved, I cannot think it advisable to use the "optical centre" as though the actual centre of refractive action were, like it, a constant point, inherent to the form of the lens, and independent of its position; or, which may come to the same thing, of the form of the pencils incident upon, or emergent from, the respective surfaces. It is certain that if a plano-convex lens has its convex side presented to parallel incident rays the refraction is divided between the two surfaces; while if the plane surface is so presented, the whole refraction is thrown on the posterior convex surface. And a very interesting fact this is when we wish popularly to give an idea of spherical aberration. But it is perfectly clear that the centre of refractive action cannot possibly coincide with the "optical centre" in both these cases. It is also pretty clear that this centre of refractive action must be the point, distance from which from the image measures most accurately the focal length of any lens. It is important to recognise the fact that the mechanical centre of such single lenses as we use can rarely be the centre of refractive action; but we must not be carried away by the phrase "optical centre" so as really to imagine that the fixed point so called can truly represent the constantly shifting centre of refractive action in a lens used in differing positions, and with incident pencils of varying forms. Other, and perhaps more familiar considerations, may show us still more strongly that with photographic lenses its use is peculiarly unsuitable.

The lecturer says, "Every lens or combination of lenses has an optical centre, and one of the chief properties of this point is that rays of light are not deflected, but pursue paths parallel to their original paths." The source of this doctrine is the fact that for mathematical convenience it is desirable to find a fixed point through which single rays (standing for the axes of centrical pencils) might be conceived to pass through the direct one without deviation, and oblique ones without permanent deflection—or, as the lecturer puts it, they might "pursue paths parallel to their original paths." The conditions are abstract ones, arranged for this express purpose, and the so-called "property" may be considered as exercised on these imaginary rays in a manner more perfect and unassailable than by any patent. It belongs to the point "by definition." Had it occurred to the lecturer, that did all lenses transmitting actual pencils of rays practically possess this property, it would necessarily follow that they were all perfectly free from distortion, seeing that "rays of light" after passing through this point, "are not deflected, but pursue paths parallel to their original paths," he would probably have reconsidered his statement. It might, indeed, be alleged that distortion is present because the rays do not pass through this point in photographic lenses. Certainly they do not, and therefore it is better left alone. The optical centre of a combination we easily see to be something quite different, having little in common with the abstract "optical centre by definition" of a single lens. The fact that in actual use of the familiar single meniscus lens, the stop, through the centre of which the axes of all pencils must necessarily pass, is always placed on that side of the lens which is furthest away from the "optical centre," should have suggested the error—not to say absurdity—resulting from the application of a method intended for one set of optical conditions to another set entirely different. Our old friend Griffin (Optics, Art. 84) formally points out that oblique excentrical pencils (as, indeed, their very name imports) do not pass through the optical centre, and though an old writer, he may often be consulted with advantage.—I am, sir, yours truly,

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[*] It may be as well to insert a caution here against the not uncommon misapprehension of confounding the term "thickness" of a lens when used in the sense generally indicated by the sign *(t)*, with its use in older treatises to indicate the *difference* of thickness between the centre and the edges of a lens. This difference showing the total prismatic action or power of a lens, thus, it is quite correct to say, in the latter sense, that distortion is caused by the "thickness" of a lens, for that is its power, and it is so that "the whole refraction is the whole distortion." But, in the sense of thickness *(t)*, such a statement would be quite erroneous. I mention this because I have known writers to fall into this very error.

106, *High Street, Oxford.* W. G. Wheeler.

Proceedings of Societies.

Photographic Society of Great Britain.

An ordinary meeting of the Society was held on Tuesday, the 13th inst., at the Gallery, 5a, Pall Mall East, Jamrs Glaisher, President, in the chair.

The minutes of the November ordinary meeting having been read.

S. G. B. Wollaston, addressing the Chairman, said: In the event of a member objecting to a candidate proposed for election, what is the rule for causing his name to be put separately?

The Chairman: It was mentioned, Mr. Wollaston, before the election took place at the last meeting, that if there was a sufficient number of black balls in the ballot box to exclude any one of the candidates, he (the Chairman) would take the balloting of each separately.

S. G. B. Wollaston: What is to be done, Sir, in a case where protest has been made, and no notice taken of it by either of the Secretaries? A protest against the election of one candidate was placed by me in the hands of the Assistant-Secretary at least an hour before the meeting commenced.

The Assistant-Secretary had no recollection of receiving such intimation, and had since been quite unable to trace it among his papers.

S. G. B. Wollaston said he would further state that during the meeting he handed up a similar communication to Mr. Donkin with like result.

The Chairman: If the notice had come into my hands due cognizance of it would have been taken; all such notices should be sent to me.

S. G. B. Wollasron considered the elections invalidated in consequence of his protest being ignored.

W. M. Ashman submitted that it was usual to address notices to the Secretaries, whose duty it would be to bring the same before the Chairman. He contended that the names included in the ballot under question were not duly elected, owing to protest having been previously made.

The Chairman said that every one of the names balloted for at the last meeting had been properly elected.

Upon a show of hands a large majority voted against passing the minutes.

The Chairman: As you have decided not to pass these minutes, I now leave the chair for ever. You will please appoint another chairman to conduct the meeting.

The President then left the chair for some minutes, but upon the solicitation of a few members returned amid some applause, and proposed the minutes should be again put as a correct account of what occurred at the previous meeting.

This course being assented to, the minutes were passed by a majority and duly signed.

Miss B. Brown, Miss Gramont S. Brown, Lieut. H. Coley, H. Chapman Jones, Walter Claude Johnson, Horace Veale, and E. A. Werner were elected members of the Society.

The Chairman then read the list of retiring officers, as required by the old rule—viz. still in force—and reminded the members that nominations to fill these vacancies must be sent in by the 23rd proximo. He also announced that the next ordinary meeting, January 10th, will be devoted to stereoscopic work, and he hoped all would contribute something of interest on that occasion.

The next technical meeting will be held on Tuesday. 27th inst.

W. F. Debenham asked what proportion of black balls were necessary to exclude a candidate from election?

The Chairman: If I find five or six at any time I should consider it sufficient indication to take a separate ballot. Of course a majority decides.

The ordinary meeting was then adjourned until January 10th, and the adjourned special general meeting for the final acceptance of the proposed new laws was proceeded with, details of which will appear in our next issue.

London and Provincial Photographic Society.

A meeting of this Society was held on Thursday, the 8th inst., at Mason's Hall Tavern, A. Cowan in the chair.

The effect of producing a positive by dissolving away a negative in boiling water, was again brought under notice by the Chairman, who showed a very vigorous positive image obtained.

In reply to questions, Mr. Cowan stated this result was achieved after ordinary pyro developed and fixed negatives had been subjected in the wet state to daylight for an hour or two. Films previously dried, or acted upon by alum, would not behave in the same manner; he thought, therefore, that there must be a sensitive layer beneath the film after fixation, which contributed to produce the positive image.

A. Haddon believed the effect to be due to the pyro developer having become spent before reaching the back of the film, thereby failing to render that portion of the gelatine coating insoluble. Hence, when boiling water was applied, the soluble gelatine dissolved, leaving a thin layer of an image on the plate.

A. Mackie exhibited a camera sent by Major Durnford. Among the advantages claimed for it were compactness, rigidity, and lightness; can be set up in less than thirty seconds; tripod head in base-board, and fall over on struts for vertical position.

W. M. 'Ashman stated that the reversal of position provided for was similar to that in use by the Scovill Manufacturing Company, New Xork.

A. P. Higgins had made a square bellows body of leather cloth, which he handed round. Leatherette and paper were said to have been successfully employed for a similar purpose.

W. Wallace enquired the cause of superficial toning of silver prints? He also, upon occasions, found a certain amount of colour removed from the image, especially in the deep shadows, by the process of lubricating before burnishing. Was this due to superficial toning?

The Chairman regarded the process of toning to be superficial, whether of long or short duration.

C. Heinrick Trinks, and others, agreed that toning silver prints was not substituting an image in gold for the image in silver, but depositing by electrolysis a layer of gold on the silver image.

A. Haddon thought, if an old toning bath had been used, some colour might be imparted to the print.

The Chairman: In that case vignettes would be affected equally with blacker prints.

W. M. Ashman considered Mr. Wallace was mistaken as to the colour being part of a toned image. He had known large quantities of prints from different batches to be lubricated with the same rubber, and nothing was removed from the surface except, perhaps, a very thin deposit of dust. If the questioner did remove any of the image, he must have applied violent friction.

What is the best material for lantern screens, other than opaque? was next discussed.

E. Clifton said that white linen was satisfactory.

H. M. Smith: Which answers best, glazed calico or unglazed linen?

The Chairman thought thick glazed union suitable.

H. M. Smith had used a glazed calico screen for five or six years, and it answered perfectly.

The Hon. Sec.: The more opaque the screen the better the definition.

C. H. Trinks found the image was always finer when a dead surface was chosen.

A. Haddon preferred a dead surface screen. When a glazed surface was employed there was always a loss by reason of reflection.

C. H. Trinks thought it was impossible to get a perfect result on a glazed surface. He suggested covering some cheap material with white paper, and when out of use rolling it up like backgrounds.

Some further remarks were made about the transparency shown earlier in the evening by the Chairman, which tended to show that a minute proportion of gelatine was retained on the plate sufficient to bind together the particles forming the image.

The extreme difficulty of removing all traces of gelatine from a plate once coated was also referred to by A. Mackie, as in preparing plates for the collodio-bromide process.

The Chairman, however, attributed this adhesive property to the glass being chemically clean.

C. H. Cooke showed a number of pretty little pictures illustrating rural scenes. These he had printed in platinotype.

Birmingham Photographic Society.

The usual fortnightly meeting was held in the Technical School) Bridge Street, on the 9th inst., E. H. Jacques (Vice-president, in the chair. W. T. Horton, Walter Griffiths, and R. Norris were elected members.

The Hon. Secretary read a letter from Mr. W. Griffiths (enclosing two plates which showed the image after exposure and before development, in which he gave the following observations :—"Having long ago observed that ordinary dry plates changed colour on exposure to daylight, I lately put one or two behind negatives in ordinary printing frames and exposed them to daylight (November) ; a few seconds produced the image you see herewith, and no amount of light after that would deepen the image In fact, I gave one an hour and it came out just the same. It was observed at our meeting on November 18th that the phenomenon frequently occurred, and was not uncommon after a long exposure, or a very bright light, such as a window, thrown upon the plate. I am inclined to think the effect can be produced at will by adhering to these conditions. It seems to me a question whether pure bromide of silver has the property of darkening upon exposure to light, or whether a trace of some "printing out" substance be present in the film, such as chloride of silver, which would account for the results. Gelatine probably contains sufficient common salt to produce the effect, though how it escapes elimination in the washing of the emulsion I cannot account for. I have kept some of these exposed plates about two or three weeks, and the image is quite distinct now, and I expect would keep indefinitely."

Discussion on the letter was postponed till such time as Mr. Griffiths would be present.

A number of exhibits were shown, notably early prints from collo-bromide plates and instantaneous pictures 1863 (Sayce) by W. J. Harrison, carbon prints by W. Curtis, instantaneous pictures of Buffalo Bill's company by A. Leeson, and a very compact and useful print and plate washer made by Fell and Co., Wolverhampton, by J. H. Pickard.

The remainder of the evening was devoted to a lantern display by Chas. Pumphrey, which consisted of a large number of views taken during a tour in the United States and Canada. He afterwards showed numerous pictures of flowers and ferns, and then exhibited the same which he had tinted and coloured by hand, much enhancing the appearance on the screen. One very effective picture was one of skeleton leaves and plants, &c.

North Surrey Photographic Society.

At the meeting on December 7th, at the Greyhound Hotel, Dulwich, with a full attendance of members and many visitors, T. James occupied the chair, and J. Thomson and Herbert Starnes were elected honorary members.

It being a lantern night no formal communication or paper was read, but several important matters of business were considered. It was decided that the night of meeting be changed to Tuesday.

J. Thomson, who had been requested by the Society to act as judge in the competition for the Hon. Secretary's prize, then gave his report. This prize was for the best set of six prints from negatives taken during this year. Having remarked on the high order of all the prints sent in, Mr. Thomson said that it was not without difficulty that he had decided to award the prize to "Achromatic," whose prints showed both great artistic merit and technical excellence. The Chairman having opened the envelope containing the name of "Achromatic," announced that Lewis Wolff was the winner of the prize. Mr. Wolff's prints, which were handed round, consisted of two albumen, three platinum, and one bromide, and it was a subject of much comment that the bromide print which was on Eastman's "A" paper, could not be distinguished from the three platinum prints either in tone or quality.

J. C. Crossthwaite announced that he would offer a prize of the value of one guinea for the best set of six lantern slides, to be sent in before the first meeting of the Society in March.

F. Buxton Morrish also announced that he would offer a prize of one guinea for the best set of six prints from negatives, to be taken during the next season, and Mr. Thomson supplemented this prize by a second of one guinea, for the best single print of those sent.

W. H. Walker commented upon the work done by the Society during the year, and offered a prize of one guinea for the best paper on any subject pertaining to the technique of photography.

The business meeting was followed by an exhibition of lantern slides, contributed by members and others. Among those deserving special mention was a series of instantaneous views by Mr. Fincham, which were of exceptional quality. Some slides by Mr. Dresser were interesting, from the fact that the negatives were drop shutter exposures on Eastman Strippers in a detective camera, and were taken in a dull light during the month of November. A number of American slides lent by the Camera Club were much admired. In all, 270 slides were put through the lantern.

Camera Club.

On Thursday, December 8th, A. Pringle read a paper on "Photographic Residues." S. B. Webber in the chair. Previous to the reading of the paper, J. B. Ferrero explained an ingenious piece of mechanism he had added to a roller slide for automatically registering the number of exposures made.

The Hon. Secretary handed round an album of J. S. Blanckensee's, containing photographs taken chiefly on the Cornish coast.

A new print-washer, invented by A. Kellar, of Cardiff, was also exhibited. In this the prints are inserted into a perforated cylinder or drum, which revolves slowly in a large trough of water, the revolution being actuated by the dropping of water from a tap upon a wheel which is attached to the cylinder. Its action was much admired.

In the course of his very practical and yet amusing lecture, A. Pringle described the best means of recovering silver from the first washing waters and cuttings of silver papers, and from hypo baths ; gold from old toning solutions, and platinum from platinotype paper and platinotype developers. He also exhibited some of the apparatus employed, and performed an experiment.

W. England showed some interesting apparatus, and described his methods of procedure.

The Chairman gave particulars from a record he had kept of the exact gold savings effected from his old toning baths. The discussion was further carried on by Messrs. Wellby, Hussey, Ferrero, the Hon. Secretary, and other members.

North London Photographic Society.

At the meeting held on December 6, at Myddelton Hall, Islington, N., J. Traill Taylor, in the chair, J. P. Meads, W. M. Ashman, and C. M. Griffiths were elected members.

The President read a letter from H. M. Smith, announcing that that gentleman was leaving London, and in consequence thereof was compelled to resign his post of Hon. Secretary and Treasurer.

Cordial acknowledgments of Mr. Smith's services were followed by the following resolution, which was unanimously carried :— "That the Society, in accepting the resignation, desires to express regret at Mr. Smith's retirement, and to thank him heartily for the services he has rendered."

Mr. Smith, at a later period of the evening, having been informed by the President of the resolution, said he felt great sorrow at having to resign his post. He should not, however, resign his membership, and hoped from time to time, during his visits to London, to be present at the meetings.

A. Mackie, in exhibiting a camera, said that it was invented by Major Durnford, whose name was well known in connexion with an ingenious little piece of apparatus known as the "Right-about-turn shutter." It was a whole plate camera, and was remarkably light and compact, the measurements being 9¾ by 8 by 3 inches, all projections included. There were no loose parts of any kind, and the tripod head was part of the baseboard. The camera simple set up would allow of a variation of focus from three to nine and a half inches, but, by an exceedingly ingenious and simple arrangement, the baseboard could be extended to allow a focus up to seventeen inches. There was a novel method of obtaining both vertical and horizontal swing to the back, and also an easily and rapidly worked arrangement for setting the camera on end for upright pictures. Major Durnford claimed, Mr. Mackie said, that the camera might, when its working was understood, be brought into action in thirty seconds; but he would demonstrate that Major Durnford had modestly over-estimated the time required.

A. P. Higgins showed a platinotype picture which he had soaked in aqua regia, the image, however, being but slightly reduced

J. Jackson passed round a print on algein paper.

T. Charters White then delivered a most interesting lecture on "Photo-micrography" (see page 790), and at its conclusion gave a practical demonstration of the method of working with his apparatus, a very good negative being produced of the tongue of a blowfly. In the discussion which ensued,

The President asked whether Mr. White found it necessary to make any allowance for the over-correction of micro-objectives for chemical focus.

Mr. White did not make any allowance, and had experienced no difficulty on that account in working with objectives up to one-fifth of an inch.

The President explained the construction of an apparatus by means of which stereoscopic effects might be obtained. He also stated that pictures might be obtained which could be mounted and viewed as stereoscopic slides by making two negatives illuminated by oblique light from opposite sides. Another method was to take one negative with half the objective, the other half being covered, the other negative being taken by covering the half of the objective used for the first negative. Stereoscopic effect could also be obtained by tilting the slide slightly, a second negative being obtained tilting the slide to the same degree but in the opposite direction.

Mr. White, referring to the difficulty of centreing the light said that the eye of *dysticus marginalis*, being a group of minute lenses, required absolute accuracy in this respect, and any deviation was very apparent from the direction of the shadows. The difficulties of photographing bacteria, which Mr. Pringle had successfully overcome, arose principally in the lighting. He found it a mistake to have too strong a light, and for ordinary purposes Bockett's microscope lamp was sufficient.

Mr. Humphries said that those who felt inclined to take up this branch of work need not be deterred by the fear that the apparatus must necessarily be expensive. An ordinary two-guinea microscope would do all the work of a more expensive instrument, the only disadvantage being that a little more time must be spent and more care taken in obtaining the adjustments. To work successfully it was necessary to have some knowledge not only of the microscope but of the object, so that its distinctive features might be brought into prominence. He would recommend beginners to choose for practice a well marked diatom, such as *arachnoidiscus*.

The President said very good micro-photographs of objects not requiring high powers might be made with ordinary photographic lenses of short focus, the little combination lenses used for postage stamp portraits being quite suitable.

The next meeting will be held on December 20, and will be a technical meeting.

Newcastle Photographic Association.

At the last meeting of this Association, held at the Mosley Street Café, the nominations of officers for the ensuing year were proceeded with, and will be voted upon at the annual meeting in January, 1888. James Downey, one of the vice-presidents, and an old and valued member of the Association, resigned on account of indifferent health, but the members present, unwilling that he should sever his connection with them, unanimously elected him as an honorary member.

P. M. Laws, the treasurer, presented a rough statement, showing that, notwithstanding the abnormal expenses for the present year, the Association was still on a sound financial basis. The expenses of the Association in connection with the Royal Jubilee Exhibition amounted to close upon £60, all of which has been provided out of the ordinary funds, except £18 10s., representing exhibitors' fees.

After the regular business was disposed of, J. P. Gibson, in the name of the members, presented Professor Herschell, the president of the Association, with a handsome album filled with photographic views contributed by the members. Mr. Gibson alluded to Professor Herschel's distinguished position and name in the scientific world, and researches appertaining to photography, and expressed the general regret at his removal from this district, and the severance of his connection with the Association, and of which he has been a member since its foundation, and president for three years; and for which he has worked so arduously and disinterestedly.

Professor Herschel, who had been kept completely in the dark as to the testimonial, expressed his gratification at the unexpected compliment, and also his pleasure at the form which it had taken.

Some choice lantern slides kindly lent by Mr. Pumphrey, of Birmingham, were then shown on the screen by Messrs. Pike and Lea.

The Society of Amateur Photographers of New York.

Lantern Exhibition.

Some recent views by Charles Simpson, illustrative of the wealth and poverty to be found in New York, were shown. His subjects were pictures of Stewart's, Gould's, Vanderbilt's, Tiffany's, and one or two other noted residences. Then in contrast he had "Mr. O'Flanigan's House," near 11th Avenue, two shanties on a rock reached by ladders from below; "Bridget Moloney's House" with her pet goats; "Jerry O'Toole's Residence," and "Mrs. Smith's House," near Second Avenue, concluding with "Senior Ragio's Castle," in contrast with Mr. Tiffany's fine house. The former was perched up on top of a high rock near the road, and was an excellent example of an Italian shanty. All of the pictures were made with a drop-shutter.

A few slides made by Lieut. Bruns were next shown, and were made from negatives which were exposed in accordance with his theory advanced last May, that the time of exposure should be regulated by the time it takes to turn a piece of silvered paper black.

A clear slide of a painting was shown, the negative having been made on an orthochromatic plate, stop $\frac{f}{40}$, exposure twenty minutes.

President Walker maintained the position he and Lieut. Bruns took on the question of exposure, regardless of the criticism of others.

The distance and foreground in Lieut. Brun's views were very clear and distinct.

Two or three views by J. V. Black were next shown representing life in Florida. One of "Foliage in South Orange, N. J.," was particularly admired because of the perfect rendering of the detail in the foliage.

William Frisbie had some excellent slides, including five views in Central Park. His "Flower Boy," "Old Jewish Burying Ground," "Market Scene," and "Elephants," were particularly good.

Three or four pictures by Dr. H. G. Piffard next appeared; one of some yellow flowers taken by the magnesium flash-light on an orthochromatic plate, and an "Interior of a Country Residence," were the best.

A few views by Edward Leaming followed, those entitled "Among the Rocks," and the "Fairy Glen," being the most attractive.

Mr. Stebbins, junr., had Mr. Frisbie make a few slides from some of his negatives, those entitled "California Road in New York," near the Catskills, "Oxen," several pictures of blooded stock, and "Read's Tide Mill," where General Washington is said to have stopped, were among the best.

One slide made by Miss Gillender, entitled "A Farmer's Family," was applauded, and showed excellent arrangement and lighting of the respective figures.

"Out in the Cold," two darkey children raggedly dressed, with the snow falling on them, was a very amusing picture. It was made by Daniel P. Read.

The exhibition then concluded with a number of excellent yachting views made by H. J. Newton, of the international yacht race between the "Thistle" and "Volunteer," interspersed with pictures on the Hudson and Bronx Rivers. Mr. Newton used fast plates for making slides, believing that thereby he gains a peculiar softness in the high lights which is not obtainable with slow plates.

Altogether the exhibition was one of the best conducted that the Society has given this season. The lanterns were well-managed, and the exhibition reflected credit upon the energy shown by the Lantern Slide Committee, in trying to give the members a satisfactory exhibtiion.

In the audience was Edgar Dudley, a member of the London Camera Club, who has just completed a tour through the United States.

Talk in the Studio.

The Examination of Ether. By G. Vulpius.—Previous to the last rectification the ether should always be treated with some fused potassium hydrate. Ether thus prepared and kept in the dark will not liberate iodine from potassium iodide. In examining ether as to its purity, the following tests should be made:—(1) 5cc. of ether are allowed to evaporate until the residue only amounts to 0·1cc. This residue should be neutral to litmus paper. (2) 10cc. of ether shaken with some water and 0·1cc. of decinormal potassium hydrate and a trace of phenolphthaleïn should turn red. (3) Potassium hydrate treated with the ether in question should not turn yellow within one hour. (4) 10cc. of ether shaken with 1cc. of a 10 per cent. potassium iodide solution in a small glass-stoppered bottle must show no colouration within one hour.—*Journal of the Society of Chemical Industry.*

The Inland Revenue and Methylated Spirit.—The *Journal of the Society of Chemical Industry* says:—A new regulation has been issued by the Inland Revenue Board. Any person authorised to receive methylated spirit for use in any art or manufacture will in future be restricted to purchasing the same from a licensed maker of the spirit.

Photographs by the Flash Light.—From Charles Knight, of High Street, Newport, I.W., we receive two excellent cabinet photographs taken with the flashing magnesium light. Mr. Knight tells us that 15 grains of magnesium powder and 7½ grains of gun cotton were used in each case. The exposure has been sufficient, although we have a larger area illuminated, and in one case there are two figures seated at a table, and in the other case a man is seated at a writing desk, and the view shows the width of the adjacent mantel-piece. Photographers should be able to make a profitable feature of this sort of thing. Mr. Knight has introduced it in his business as the "Lightning Flash" photograph.

Photographic Club.—The subject for discussion at the meeting on Dec. 21st will be "Relation of the Quality of Negatives to the Quality and Permanence of the Silver Print."

Dallmeyer "On the Choice and Use of Photographic Lenses." One Shilling: Dallmeyer, 19, Bloomsbury Street.—We have received a new edition of this useful little hand-book. Any photographer who carefully reads it is in a position not only to understand what class of lens is adapted for each kind of work, but also the why and wherefor of the matter. In addition to this there are numerous useful hints as to the using of lenses, together with tables of enlargement and reduction; also a table of relative rapidity calculated on the Dallmeyer standard.

London and Provincial Photographic Association.—On Thursday, December 22nd, a paper will be read by Norman Macbeth on the "Construction and Requirements of Portrait Art."

To Correspondents.

⁂ Communications intended for the Editor should be addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, E.C."

⁂ We cannot undertake to return rejected communications.

J. R. Mackay.—We have endeavoured to give you the additional information you desire in a private note. Let us know whether further information is needed.

Chapman Jones.—1. Thank you for the MS., which has been put in hand. 2. You could not have done better than to place them in the quarter you name.

W. H. Wheeler. 1. We will write to you about the subject of your communication. 2. There are certainly difficulties, but we expect that you will be able to deal with them satisfactorily.

C. S. Lewis.—1. The salt in question is not poisonous, but some commercial specimens contain a small proportion of the poisonous cyanide. Warm sulphuric acid—even if not very strong—will liberate the highly poisonous hydrocyanic acid from it, and you must remember that this acid is highly volatile. 2. It is sold at a gasfitting shop—Wentworth is, we think, the name—nearly opposite to Christ's Hospital, in Newgate Street. 3. Where the diaphragm of the lens was previously. Yes. 4. Quite the same principle: but we suppose that neither will suit very well for ordinary interior work.

J. H. Bridge.—Thank you very much for the two papers, which are, unfortunately, too late for the Year-Book, but are available for the News if you have no objection. The four marine views you send please us extremely.

M. C.—Put a test object in the plane of your sensitive film, and focus the enlarged image: then mark the two positions once for all. This is on the assumption that your objective is corrected; if not, the difference must be determined by trial.

Notts.—Write to Harold Senier, 88, Norwood Road, S.E.

Robert F. Guthrie.—A weak solution of chloride of palladium, twenty grains to a pint of water if the film is hard, but when the collodion is very porous this will act so rapidly as to be rather unmanageable. A little chloride of gold can be added if a warmer tone is desirable, or add chloride of platinum (tetrachloride) if you want a colder tone.

Cambrian.—Nearly all the half-top and sides may be of glass, as it is easy to shade with blinds when necessary. Still, three or four feet at each end may be opaque if you prefer it.

William Jones.—At the present moment we cannot either lay our hands on the details, or refer you to any book containing them; but we will deal with the matter next week.

T. C.—Under the circumstances you will, we think, have no reasonable hope of competing with those who have been trained to commercialism, unless you have qualifications and opportunities which you have not enumerated.

Bichromate.—Do not use common glue, but obtain a cut soup gelatine sold by Nelsons as "extra soluble." It costs about 2s. a pound.

Kate.—Do not try to alter the colour, as you will probably spoil it. Hang them in frames of different pattern and general colour: then what you complain of will hardly be noticed.

Tyro.—The salts are nearly opaque to the actinic rays, and this may be given as one part of the reason why the action is mainly confined to the surface.

C. Pittock.—We must take time to consider the matter; probably your communication would be misunderstood by most of our readers if inserted as you have sent it, and, moreover, it would be difficult to do justice to the illustrations. We will write to you.

A Subscriber.—First, there is probably fatty matter in the gelatine; and secondly, the plates appear to have been exposed to sudden draughts—or rapidly-changing degress of heat—in the drying.

W. H. A.—Colour them with the special colours sold by artist's colourmen. We think they can be obtained from Winsor and Newton, of Rathbone Place.

Opal.—Grind off with a piece of flat wood and sharp sand.

J. Guardia.—We will send you some copies.

Edinburgh.—Hopkins and Williams, Operative Chemists, Cross Street, Hatton Garden, London.

Enquirer.—It is, we believe, a quality made in Newcastle. Write to G. F. Williams, 36, St. Martin's Lane, Charing Cross.

O. Campo.—It shall be sent.

⁂ Several answers stand over.

The Photographic News.

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A PHOTOGRAPHIC EXHIBITION AT THE CRYSTAL PALACE.

When the Crystal Palace was a new outcome of the great Exhibition of 1851, and the interest in it—and also in photography—was fresh, the Photographic Exhibition held at Sydenham in the latter part of 1858 came upon the public essentially as a feature of the time—a thing to be talked of outside photographic circles. There had been photographic exhibitions before, and indeed page 29 of our first volume, which appeared in 1858, contained a comment on the fact that so many photographs which had been already at Manchester, once more at South Kensington, and again at Coventry Street, were still another time shown at the Crystal Palace. The Crystal Palace Exhibition was, however, probably the first where the claims of photography to a distinct recognition as a great branch of the reproductive arts were duly put before the general public, and we are pleased to learn that a photographic show on a somewhat large scale is now being organised, and it is expected that this Exhibition will be opened upon Monday, the 25th of February next.

The show is to include not only photographs, but photographic appliances of every kind, and there is to be a competitive show of lantern slides; and, indeed, the whole exhibition is to be competitive, the awards being in the hands of a committee of judges yet to be appointed.

We are told that every endeavour will be made to so arrange the judging as to preclude the undue influence of any one person or group; and the system will, it is stated, be this. About forty judges will be appointed, twenty in the apparatus department, and about twenty in the photograph department, and each of these judges will be furnished with a catalogue having a blank space opposite every entry, this blank space being intended for a number expressing the judge's appreciation of that particular exhibit. The excellent point of the system is yet to be explained, and it is that the numbers shall be added up by a clerk, and shall not be subject to revision at a general meeting of the judges, where there may be a possibility of a chairman, either consciously or unconsciously, discussing matters beyond his province as chairman, and thereby unduly influencing the assembly.

On the prospectus we have a long list of "patrons," but as in a conversation with a member of the executive committee we could in no sense gather what are the functions of a patron, or whether he has any function whatever, we cannot even conjecture whether the selection of patrons has been a wise one, but we may say that it includes some earls, bishops, justices, and aldermen.

The executive committee is a small one, and likely, we think, to work well, the members being:—S. G. Buchanan Wollaston, W. H. Hyslop, and J. F. Peasgood.

The following is the schedule of classes:—

Art Division.

Class A.—*Out-Door Photography.*—Section 1, Pure Landscapes; 2, Landscape, with Figure; 3, Architecture: (*a*) Exterior; (*b*) Interior; 4, Instantaneous Photographs, including Marine Subjects.

Class B.—*In-Door Photography.*—Section 1, Direct Portraiture; 2, Home Portraiture; 3, Enlargements.

Class C.—*General.*—Section 1, Groups; 2, Combination Pictures; 3, Photographs Mounted in Optical Contact; 4, Ceramic Photographs; 5, Orthochromatic Photographs: 6, Photo-mechanical Pictures; 7, Micro-photography; 8, Bromide Prints by Contact; 9, Carbon Pictures.

Class D.—*Transparencies.*—Section 1, Photographic Transparencies for Decorative purposes; 2, Photographic Lantern Slides.

Class E.—*Stereoscopic Photography.*—Section 1, Stereoscopic Slides—Paper; 2, Ditto Glass.

Apparatus Division.

Class A.—*Wood-Work, &c.*—Section 1, Cameras and Fittings, including Detective Cameras; 2, Appliances for Paper and Film Photography; 3, Tripods, and Studio Stands; 4, Studio Furniture, including Upholstery.

Class B.—*Optical.*—Section 1, Lenses; 2, Instantaneous and Time Shutters; 3, Finders and View Meters; 4, Enlarging Apparatus; 5, Lanterns; 6, Appliances for Artificial Illumination; 7, Stereoscopes.

Class C.—*Cheap and Popular Sets.*

Class D.—*Dry Plates and Films.*

Class E. *Surrounds.*—Section 1, Mounts; 2, Frames Specially Suitable for Photographs; 3, Albums and Cases.

Class F.—*General Appliances and Plant.*

Class G.—*Cycles Fitted for Photographic purposes.*

Lantern Division.

Regulations and other information respecting the Competitive Lantern Entertainments, which will take place during the Exhibition, may be obtained on application to the Executive Committee.

The Rules are as follows:—

I. Application for space upon the official form must be filled up and returned to the Executive Committee on or before Saturday, February 4th, 1888.

II. All goods or pictures for exhibition must be delivered, carriage paid, on or before Saturday, February 11, 1888, addressed to the Executive Committee, and bear, in a distinct manner, the name and address of the sender, together with the number of the table or space assigned to the exhibitor. The Committee reserve the right to refuse any exhibit, without stating any reason for so doing.

III. No exhibit shall be removed until the close of the exhibition, immediately after which each exhibitor must pack and remove his goods at his own expense. The Executive reserve to themselves the right of doing whatever they may consider necessary, at the expense of the exhibitor, unless this regulation is strictly compiled with.

IV. No sales shall be allowed to take place during the Exhibition, nor may photographs of the Palace or Grounds or any part thereof be taken, but orders may be booked for duplicates of any Exhibits.

V. In the apparatus division, tables or floor space will be provided for Exhibitors 16 ft. by 12 ft., which will be subdivided to suit requirements into spaces of 16 ft. by 6 ft. or 8 ft. by 6 ft., for which a charge will be made of 1/6 per square foot. No Exhibitor will be allowed to transfer any portion of the space allotted to him, or to allow any other than his own duly admitted exhibits to be placed thereon, without the consent of the Committee.

VI. In the art division, a fee of 2s. 6d. per frame (irrespective of size) will be charged. No Oxford frames will be admitted.

VII. Photographs coloured by artificial or mechanical means will be excluded, except under Class C, Section 4.

VIII. Reasonable care will be taken to protect exhibits; but neither the Directors nor the Executive Committee will be responsible for any loss or damage arising from fire, accident, or any other cause.

IX. A non-transferable admission ticket will be supplied to each exhibitor; and, in the apparatus division, to an atendant where necessary, which will pass the holder into the Palace without payment, on each day of the exhibition.

X. No exhibitor will be allowed to display his goods or Name-board (which must in every case be placed longitudinally with the nave), to the annoyance or detriment of other exhibitors, and the Directors may require the removal of any obstruction, or anything which in their judgment contravenes this rule.

XI. No substance of a dangerous or explosive nature shall under any circumstances be exhibited.

XII. All who become exhibitors signify by so doing their compliance with the whole of these regulations, and with all the rules and regulations of the Crystal Palace Company, together with such other regulations as the executive may issue from time to time. Notice is hereby given that the right of taking photographs in the Palace and Grounds has been let by the Company under an agreement for a term of years, and all exhibitors are expressly prohibited from taking photographs of any kind whatever.

XIII. Awards will be made in each Class, provided the judges deem any exhibit or exhibits of sufficient merit. From the decision of the judges there shall be no appeal.

XIV. All correspondence and enquiries to be addressed to the Executive Committee of the Photographic Exhibition, Crystal Palace, S.E.

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THE NEW MODEL EASTMAN ROLLER SLIDE AND THE STRIPPING FILMS.

The one weak point of the Eastman film negatives, in which the paper was left to obscure the finished negative, was the unsatisfactory nature of all the methods proposed for making the paper transparent, and the only real objection regarding the roller-slide was, as far as we know, the fact that its bulk often made it impossible to fit it to an ordinary camera of the same nominal size. The recent introductions of the Eastman Company serve to overcome both these obstacles to film photography. The new roller slide is compact, and the whole-plate instrument sent to us is small enough to fit easily to each one of three whole-late tourist cameras, against which we have placed it; hile the merits of the stripping film, and the modes of working, are well known to many of our readers, and, moreover, are pretty fully detailed in the Year-Book.

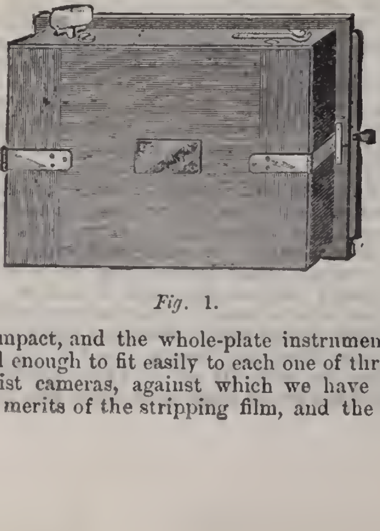

Fig. 1.

In the new Eastman slide—which, as far as its general appearance is concerned, is represented by the accompanying block, while figure 2 shows it with the cover removed, and the case detached from the shutter frame, figure 3 is a sectional view of the holder loaded with the spool of film.

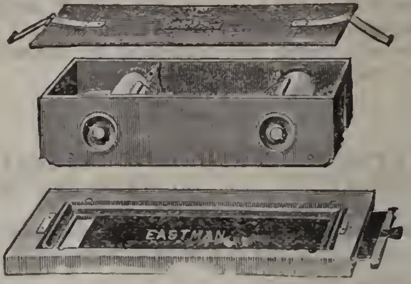

Fig. 2.

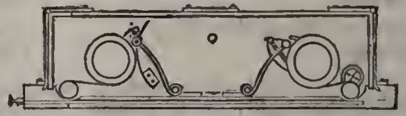

Fig. 3.

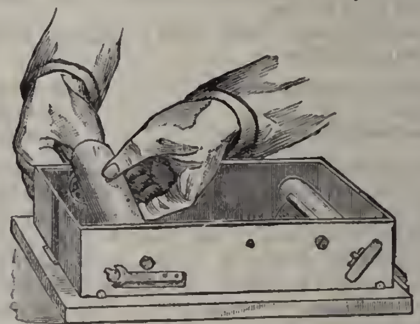

Fig. 4.

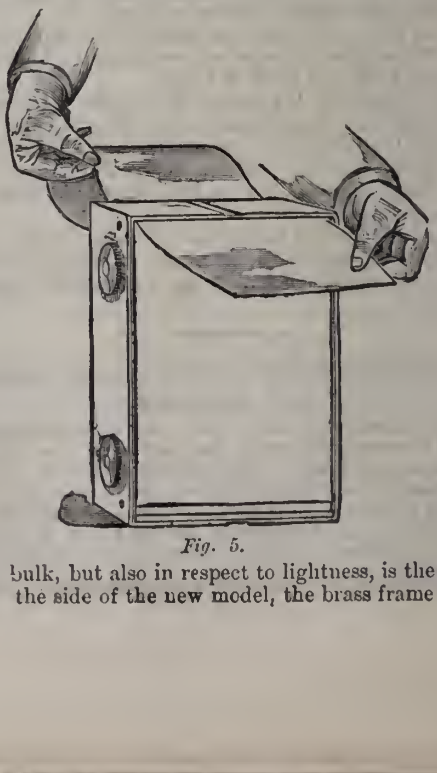

Fig. 5.

In figure 4 and figure 5 one sees illustrated the method of putting the roll in the new slide; this operation being, as far as our experience goes, more quickly performed in the new instrument than in the old patent. Not only as regards bulk, but also in respect to lightness, is the advantage on the side of the new model, the brass frame having been done away with; and so far is lightness carried that the whole-plate slide placed at our disposal weighed, when charged with its spool of stripping film for twenty-four exposures, was considerably less heavy than three corresponding double backs loaded with plates, against which we tried it. Moreover, we were given to understand that the same instrument would take a roll of stripping film for a larger number of exposures; indeed, as a matter of fact, the roll which was nominally for twenty-four exposures, really gave twenty-five.

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AN IMPROVED METHOD OF INTENSIFYING GELATINE PLATES WITH SILVER.

BY E. HOWARD FARMER,
Lecturer on Photography to the Polytechnic Institute.

A solution is prepared as follows:—

No. 1.—Silver nitrate	1 ounce
Water (distilled)	12 ounces
No. 2.—Potassium bromide	¾ ounce
Water	2 ounces
No. 3.—Sodium thiosulphite (hypo) ...	2 ounces
Water	6 ounces

Add No. 2 to No. 1, and after washing the precipitated silver bromide thoroughly by decantation, dissolve it with agitation in No. 3. The muddy liquid thus obtained is filtered or placed aside for a day, and the clear solution decanted off; it is then made up to sixteen ounces with water, and kept for use.

To intensify a plate, wash after fixing, and flood with the following mixture:—

Sulpho-pyrogallol	40 minims
Water	2 ounces
The above silver solution ...	60 minims

to which is added, immediately before use, about 30 minims of 10 per cent. ammonia solution. If the silver shows no tendency to reduction, add more ammonia, or if it be thrown down immediately, use less; with a little experience a peculiar browning of the liquid shows when sufficient ammonia is added. Rock the plate, and apply fresh solution as the density increases. Finally, place negative for a short time in the fixing bath, and wash.

Second Method.—Immerse the washed plate in the silver solution, and leave it there for five minutes, take out, drain, and flow with an ordinary oxalate developer, when the image will rapidly increase in density.

If the plate only requires slightly intensifying, dilute the silver solution more or less, as desired. Finally, place in fixing bath, and wash as before.

The *rationale* of the method is that the intensifier acts in precisely the same manner as a wet plate and intensifier, but that the silver being dissolved in and reduced from hypo, and the solution being alkaline, no special precautions are required to free the plates from hypo, and no stains are produced.

Plates which from having been dried and kept, or from the film being very hard, refuse to intensify, are treated before the operation with weak hydrochloric acid, and washed.

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HISTORICAL NOTES ON THE OPTICAL LANTERN.

BY W. H. HARRISON.*

My first invitation to read a paper before a photographic society having emanated from this Association, it is a pleasure to respond to that honour. The announced title of my memoir was "Lanterns and Lantern Slides in the Nineteenth Century," but now that the paper is finished, it contains some information of earlier date, hence that title acts as a kind of bed of Procrustes, and either the title or the paper must be cut in two to suit each other, therefore a new heading has been chosen. The details about the optical lantern collected to bring under your notice are historical rather than scientific.

The history of the optical lantern, the "magic lantern" of our younger days, has yet to be written, for to my surprise, after beginning to investigate the subject, I have been unable to discover a single book devoted to the history of the instrument, and the complete story will have to be gathered hereafter from scattered works on optics, from encyclopædias, and from certain old trade catalogues of opticians which may chance to have escaped the ravages of time and pipe-matches. A few books, or rather pamphlets, worth perhaps about a shilling each, exist, devoted to descriptions of special forms of the modern instrument. The following notes represent the results of such small research as could be made within the past week or two among records of the past, and they may serve to roughly indicate to the real historian of the future the general nature of the path he will have to traverse.

One reason of the paucity of the literature of the optical lantern is that, up to recent times, the instrument has been regarded merely as a means of amusement. In the English Patent Office it is not entered under the heading of Optics, and he who would discover patented inventions related thereto, will find it classed by the Government under "Toys." The earliest patent taken out in relation to the lantern bears so late a date as January 14, 1860, by Mr. Willoughby Smith, of Atlantic Telegraph celebrity.

The magic lantern was invented by Athanasius Kircher in the year 1646. There are speculations that it may have been known before his time. Some have ascribed its invention to Roger Bacon, who, in his *Discovery of the Miracles of Art, Nature, and Magic*, written about the year 1260, displays knowledge of the uses of lenses. Others have speculated that it may have been known to Egyptian hierophants, because they understood the properties of concave mirrors. Cellini, who died about 1570, describes spectres which had been seen in ascending smoke, and it has been said that these must have produced by an optical lantern. All this is but speculation. The one thing which can be clearly seen by us when peering into the mists of antiquity, is that Kircher gave the first clear description of an optical lantern, and was personally proud of its invention, see *Ars Magna Lvcis et Vmbræ*, Athanasii Kircheri, *in decem Libros digesta*, Romæ, MDCXLVI. In his preface to a portion of this book devoted to optical instruments, including some peculiar cameras among other things, he says they are not the work of the devil, but the result of contemplation. He adds that he has to tell of one of the rarest secrets of nature, that it will excite admiration in the minds of spectators, that nobody has done anything of the kind before, that he made the first experiments before any one else knew anything about the matter. Other people sometimes promised rare, wonderful, and unheard of things which afterwards proved all wrong, but what he had to tell would prove all right. Evidently the worthy priest, for priest he was, stood upon excellent terms with himself.

Kircher was born at Giessen, near Fulda, Germany, May 2nd, 1602. He was, when a boy, educated in the College of Jesuits at Fulda, and in the course of his ecclesiastical career resided at Cologne, Coblentz, and Mayence. In 1635 he was Professor of Mathematics at Vienna; subsequently he went to Rome, where he died November 28, 1680. Kircher's lantern contained a plano-convex bull's-eye condenser, a double convex lens as the objective, and a conical oil flame as the source of light; the slide was placed between the condenser and the light. Messrs Carpenter and Westley have a diagram of Kircher's lantern in their possession. Kircher was a voluminous writer; the titles of his books form a long catalogue. He prided himself on his skill in deciphering hieroglyphics. A student, one André Muller, did some scribblings on a parchment and forwarded to Kircher, as antique records; the unsuspecting *savant* replied that they were true hieroglyphics, and sent Muller the translation.

Leonard Euler, the mathematician, invented the modification of the optical lantern for exhibiting images of opaque objects, and he described it, with a diagram, in one of his published *Letters to a German Princess*, dated January 8, 1762. It consisted of a lantern with a tube and double convex lens in front, and at the back, opposite the lens, was a kind of saucepan lid, which held the object to be projected. In the lantern were two opaque screens, or wings, behind each of which was a lamp with a large wick. The lamps illuminated the object, and the wings screened the light from the lens. He says: "I have contrived in this box two side wings for the reception of lamps with large wicks, and in each wing is placed a mirror to reflect the light of the lamps on the objects. . . . . The ordinary magic lanterns, however, are not constructed in this manner, and serve to represent no other objects but figures painted on glass, whereas this machine may be applied to objects of all sorts. To magnify a fly to the size of an elephant, he recommends that the rays of the sun shall be concentrated upon it by a "burning glass," to give sufficient illumination. This treatment, we may surmise, would be bad for the fly.

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* A Communication to the London and Provincial Photographic Association.

In the *Dioptrica Nova*, by William Molyneux, published in 1692, is an engraving of a magic lantern, in all respects the same as that of Kircher—a simple oil flame, a plano-convex bull's-eye of great curvature, and a double convex objective. Molyneux calls it the "Magic Lantern, sometimes called the Lanterna Megalographica." He speaks of it as a well-known instrument, made by "common glass-grinders," and he states that in some of the instruments a reflector is used instead of the lenticular condenser.

For about 150 years little or no improvement was made in the original instrument of Kircher. Towards the close of the eighteenth century, Dr. Gravesande, a Dutch man of science, described a magic lantern containing a four-wick lamp. The oil from the lamp traversed a horizontal pipe carrying the wicks. The flame was made up of four little flames which, by touching one another, made "one square flame two inches wide." A concave reflector behind increased the illumination. This lantern had a five-inch double convex condenser. The objective consisted of two double convex lenses; the diameter of the one next the light was three and a-half inches, and was of considerable convexity. The front lens of the combination was smaller and flatter, and was placed three inches from its neighbour. There was a diaphragm between the lenses, and the information was published that unless the diaphragm "be just where the rays intersect, it does a great deal of mischief." For additional information about this lantern see "A Compleat System of Opticks," by Dr. Robert Smith," Professor of Astronomy at Cambridge, and "Master of Mechanicks to His Majesty," 1784. Five years after this, in the year 1789, Argand invented his lamp. Before this date the optical lantern was necessarily an imperfect kind of instrument, unless sunlight were used as the illuminant. The solar microscope was invented by Nathaniel Lieberkuhn, of Berlin, in 1738.

With the exception of the step described by Gravesande, all the great improvements in the optical lantern have been made within the last one hundred years; before that time illuminants were too feeble. If I remember rightly it was Charles Lamb who described our forefathers as persons who "walked in the dark, groping."

Phantasmagorial effects were first seen in London in 1802, at the Lyceum; their advent is thus described in *Chambers' Journal*, of April 28th, 1849:—

"In 1802, a French gentleman, a M. Philipstal, astonished crowds of people in London by an optical exhibition which he entitled the Phantasmagoria. It was a soul-appalling spectacle to those who had hitherto been ignorant of the wonders of light and shade. The spectatory was a room where no light but that of a dismal oil lamp, hanging in the centre, was admitted. On the assembling of the audience, this lamp was drawn up into a chimney, and a pitchy gloom overspread the place. Presently the soft and mournful notes of sepulchral music were heard, and a curtain rose displaying a cavern, on the frowning walls of which were depicted the forms of skeletons and spectral figures. The music ceased; the rumbling of thunder was heard in the distance. Gradually it became louder, until at length vivid flashes of lightning, accompanied with peals apparently of the deep-toned organ of the skies, gave all the impressions of a tremendous storm. The thunder and lightning continued at their height, when suddenly a small cloud of light appeared in the air; it gradually increased in size, until at length it stood revealed a ghastly spectre, around whom the lightning gleamed in fearful reality. Its eyes moved agonisedly from side to side, or now turned up in the sunken eye-socket, the image of unutterable despair. Away, back to the dim abyss from whence it came it was seen swiftly to retire, and finally vanished in a little cloud, the storm rolling away at the same time. Then came other phantasms, some of which rushed up with apparently amazing rapidity, approaching the spectators, and again as rapidily receding, to return clothed with flesh and blood, or in the form of some well-known public personages. After a display of a number of similar apparitions, the curtain fell."

If the man were still living who wrote the foregoing harrowing description of a magic lantern entertainment, and were to apply to the *Daily Telegraph*, he would probably be engaged as a leader writer straight off. How the narrative reminds us all of early days at the Polytechnic, when from the depths of the yawning cavern the bloodthirsty ogre expanded into view, amid the crash of gong and the roll of drum, while Mr. J. L. King, who governed these terrible powers, steadily controlled the incantations without being the least bit frightened; he ruled the whirlwind and the storm, unmoved and serene he stood amid all the horrors of a Walpurgis night.

Phantasmagorial effects, it is scarcely necessary to state here, are produced by means of a translucent screen behind, and to and from which, a lantern is run upon rails; as it approaches the screen the figure represented diminishes in size; as it recedes from the screen the apparition increases in size, but diminishes in brightness. To equalise the illumination various devices have been invented, among them the interposition of a varying number of curtains. The objective has to be moved in its tube as the lantern advances or recedes, so that the image shall always be in sharp focus upon the screen. Some operators have been clever enough at private lantern displays to manage all the motions of the camera and its parts without additional automatic appliances; their plan in old days was simply to tuck the lantern under one arm, and go to work. With a modern three-wick lantern the temperature would, under such circumstances, be objectionable.

Before lantern objectives were constructed capable of giving a flat field upon the screen, the designs to be exhibited were in some rare instances painted upon concave instead of flat pieces of glass; these old concave slides are now great curiosities.

The oldest manufacturers of magic lanterns in this country are Messrs. Carpenter and Westley, of Regent Street, London. Philip Carpenter began the making of lanterns in Birmingham about the year 1808, and subsequently the late William Westley, who was born in 1807, entered his employment. In 1827, shortly after the removal of the business to London, William Westley rejoined his employer, first as foreman, then as partner; lastly he became the principal. He died at the beginning of this year, and was buried in Highgate Cemetery. Philip Carpenter was the uncle of the late Dr. W. B. Carpenter, the physiologist; the latter is said to have acquired his taste for scientific pursuits from the interest he took as a boy in the lanterns and lantern slides of his uncle. When dissolving views were invented, about 1836, by an Italian, whose name I have been unable to obtain, and, it is said, Henry Childe, independently of each other, Dr. Carpenter wrote to Messrs. Carpenter and Westley, asking how they were produced and giving his own theory; he did not guess that two lanterns were brought into play. That letter is still in existence. When dissolving views were first invented, William Westley put them before the public, but the method of their production was kept secret. William Westley raised lantern slide painting to a fine art; he selected the best artists and encouraged them to improve by paying them twice the usual fees for their work, with something in addition for any exceptional specimen of skill. Among the best slide painters he employed may be mentioned Thomas Kearnan, the best slide painter of architectural subjects who ever lived; he died in 1872. Another was Henry Childe, who claimed the invention of dissolving views; he was clever at scenic effects, such as rippling water, summer and winter, eclipses at sea, and so on. Another was S. H. Baker, the best man who ever painted landscapes on glass for the lantern. J. Smith and Thomas Clare were other noted slide painters of the past, so also was Charles Simpson, a miniature and portrait painter by profession, who subsequently became blind. Lastly, C. Constant, the painter of comic slides, should be remembered; he has made himself immortal by devising the world-wide famous slide of the sleeping man swallowing endless processions of rats. All these painters have departed this life with the exception of Mr. Baker, who now occupies a high position in connection with the Birmingham Society of Arts. Kearnan and Simpson were interred by the late William Westley in the same grave in Brompton Cemetery.

Messrs. Carpenter and Westley introduced the crescent form of dissolver, in which a crescent was cut out near the circumference of a circular disc; it gets rid of the shadows on the picture cast by opaque dissolvers. Philip Carpenter, the founder of the business, materially helped Sir David Brewster in the invention of the kaleidoscope. A few days ago I had the pleasure of meeting in the establishment a nephew of each of the founders of the firm, from whom the particulars herein given in relation to its history were obtained. They have about 12,000 slides on the premises, some of them by departed artists, whose productions they will not now part with on any terms, and all people connected with the lantern trade agree in telling me that photography has killed lantern slide painting as a fine art.

PHOTOGRAPHY IN 1887.

BY C. H. BOTHAMLEY, F.I.C. F.C.S.[*]
The Yorkshire College, Victoria University.

I PROPOSE with your permission to classify what I have to say under three heads, namely, progress during the past year; the present position and utility of photography; the claims of photography to rank as a creative art.

A considerable amount of evidence has been accumulated with reference to both the principles and practice of orthochromatic processes, and it may fairly be claimed that the value of these processes has been clearly established, although very much still remains to be done before the methods can be regarded as approaching perfection. For the reproduction of paintings orthochromatic methods have become indispensable, and the excellence of the results obtained, when they are combined with photogravure, is truly remarkable. In photographing pottery, flowers, and similar subjects the advantages are likewise very strongly marked. A more extended series of experiments on the use of plates prepared with erythrosin for landscape work confirms the conclusion previously expressed, that the gain over the ordinary process is more considerable than might be expected from general considerations, whilst at the same time it is much more strongly marked with some subjects than with others. The improvement is most noticeable in the rendering of foliage, water, and distance. The masses of foliage are bolder, and trees of different colour and character are much more clearly distinguished. The distance is rendered more clearly, especially during the prevalence of that almost imperceptible blue haze which is frequently so troublesome, whilst at the same time the atmospheric effect is not lost if care is taken not to use a screen of too deep a tint. The gradations of the water are softer and more pleasing, and the reflections, usually so difficult to render, are obtained in a satisfactory manner.

Erythrosin is still the most powerful known sensitiser for the less refrangible rays, and is the most useful for general purposes, whilst cyanin is unsurpassed for subjects which contain much * orange and red. Mr. Wellington has recently introduced certain modifications by means of which he is able to increase the stability of the cyanin and the plates prepared with it.

The most noteworthy improvement in the methods of photomechanical printing is Husbands' *Papyrotint*,[†] a method of photo-lithography in half tone, the necessary grain being obtained by means of potassium ferricyanide. The transfer paper is first coated with gelatine containing glycerine and a considerable proportion of common salt, and then, after drying, with gelatine containing potassium bichromate salt and a considerable proportion of potassium ferricyanide. After exposure the transfer is treated with water, inked, and transferred to stone. The character of the grain can be modified by altering the proportion of ferricyanide, drying at a higher or lower temperature, and varying the temperature of the water with which the transfer is treated. Even a fine grained transfer will yield as many as 1,200 copies. The results are very satisfactory.

A discussion as to the relative permanence of prints produced by different methods has naturally excited considerable interest, but has been characterised by a considerable amount of reasoning based on false analogies, and the display of an inadequate knowledge of chemistry on the part of otherwise able and skilful photographers. Without at present entering into the question in any detail, it may be useful to point out that a print produced on albumenised paper in the usual way is something totally different from a print produced by development from an emulsion, and the properties and reactions of the one afford no guide whatever as to the probable behaviour of the other under similar conditions.

A most important contribution to the science of photography has been made by Carey Lea, whose papers have been reprinted in most of the photographic journals. His investigations deal mainly with the nature of the invisible or latent image. The two theories which have hitherto divided photographers on this question are generally known respectively as the physical theory and the chemical theory. According to the first the light waves impinging upon the silver salt throw the molecules into such energetic vibration that the molecular structure is very nearly shattered, or, in other words, the attraction of the silver for the chlorine, bromine, and iodine is so far overcome that the developing solution is able to complete the destruction of the molecule by removing the bromine and leaving the silver in the metallic state. According to the chemical theory, the light waves acting on the silver salt in presence of moisture, organic substances, &c., decompose it, splitting off half the chlorine, bromide, or iodine, and leaving a sub-chloride, sub-bromide, or sub-iodide. This sub-salt is at once attacked by the developer, and the metallic silver thus formed constitutes the nucleus upon which the image is built up by the subsequent action of the developer.

Carey Lea has hitherto been one of the most enthusiastic supporters of the physical theory, but it is extremely interesting to find that the investigator who has shattered the chief argument in favour of this theory is—Carey Lea! We have here an excellent illustration of the fact that a truly scientific man has little respect for even his own pet theories if they are found to be inconsistent with the facts. Carey Lea observed that if a film of silver iodide obtained by treatment with a solution of iodine is exposed in the camera and is developed immediately, an image is obtained; but if the exposed plate is put on one side and not developed until some time afterwards, no image is obtained, the latent or developable image having gradually disappeared. He now finds, however, that silver iodide has the property of absorbing and retaining a certain quantity of free iodine. In the experiment described the silver iodide retains some of the free iodine contained in the solution by means of which it has been prepared, and when an exposed plate is allowed to remain undeveloped, this small quantity of free iodine gradually combines with the sub-iodide which has been formed, and reconverts it into the ordinary iodide. The fading of the latent image is, therefore, the result of a chemical and not a physical change.

Carey Lea finds that by the action of certain reducing agents he can obtain from silver chloride, bromide, and iodide by purely chemical means, and without the action of light, coloured products identical in composition, and properties with the coloured products obtained by the action of light on the same salts, and therefore, in all probability, of the same chemical nature. These products vary in composition according to their mode of formation, but always contain less bromine, chlorine, or iodine, than the ordinary salts, whilst they are much more stable than the so-called sub-salts. Carey Lea regards them as compounds of the sub-salts with a large excess of the unaltered ordinary salt, and proposes to call them photo-salts, that is, photo-chloride, photo-bromide, and photo-iodide.

He also finds that certain reducing agents, and notably sodium hyposulphite, will produce on a sensitive film an invisible effect which, like the effect produced by light, can be developed into a visible image. The latent images produced by light and by the reducing agents behave in precisely the same manner towards reagents such as nitric acid and the haloid salts of potassium. What destroys the one, destroys the other. What does not affect the one, does not affect the other. It is fair to conclude therefore that the latent image is of the same nature in both cases. Moreover, just as light can produce both direct and reversed images, so the reducing agents can produce direct and reversed images, and the conditions under which reversal takes place, are similar in both cases. Light can, in fact, reverse the image produced by the reducing agents, and *vice versa*. In both cases, continued action results in the formation of visible photo-salts. The formation of an invisible or latent image is the initial stage of a reaction which, when prolonged, produces a visible effect, and it follows that the invisible and visible images differ in degree only, and not in kind, as Abney has always contended.

An invisible but developable image can be formed on film of silver tartrate, silver oxalate, and other silver salts. If before development the film is treated with hydrochloric or hydrobromic acid, so that the whole of the silver salt is converted into chloride or bromide, the latent image is not destroyed, but can still be developed; the resulting image is even more intense than that obtained when the salt is not converted into chloride or bromide. It follows that the alteration in composition or constitution which renders the silver salt amenable to the action of the developer can be transferred from one salt to another, and Carey Lea regards this as evidence of the general existence of sub-salts of silver corresponding with most if not all the ordinary salts.

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[*] The Presidential Address to the Yorkshire College Photographic Club.

[†] PHOTOGRAPHIC NEWS, 1887, p 693.

[‡] PHOTOGRAPHIC JOURNAL, p 126.

It should be pointed out that the existence of definite sub-salts of silver is still a disputed point amongst chemists. We may, however, take Carey Lea's results as proving that the production of the latent image by the action of light is an instance of a chemical change produced by a physical agent, and that the material of which the latent image is composed is chemically different from the salt which has not been affected by light, but the exact constitution of this material has still to be determined.

In this year of Jubilee it is not altogether inappropriate to attempt some sort of general estimate of the present position of photography, especially as the Art may be said to have begun with Her Majesty's reign. To the majority of people, photography is simply a useful process for obtaining "likenesses" and "views." Of its artistic capabilities, and of the extent to which its results, direct or indirect, permeate our every-day life, they have not a suspicion. It is even not too much to say that a large proportion of photographers—of amateurs, at any rate—have little idea of the multitudinous uses to which the Art is put. There are few things more remarkable in the history of applied science than the rapid development of photographic processes during the past thirty years, and it is not extravagant to claim that this is an age of photography as much as it is an age of steel, or of electricity.

Even if it were merely a method for producing likenesses we should find it very difficult to dispense with it now, but its utility is far more wide-spread than this. The physicist and meteorologist use it constantly as a means of accurately and anatomically recording observations; the astronomer finds that he can photograph stars and nebulæ otherwise outside human ken; the microscopist, instead of spending hours upon hours in delineating a complex structure, attaches his microscope to a camera and makes the structure produce its own image; the anatomist and physiologist employs the drop-shutter and the sensitive plate as the only available method of analyzing the rapid movements of man and other animals. We have already evidence that the day is not far distant when cameras attached to balloons will not only give us an accurate plan of a vast stretch of country, but may enable contending armies to provide themselves with maps of the country through which they are marching, and also to ascertain the exact distribution of the enemy's forces. To-day no explorer's outfit is complete if it does not include a camera, and the records of distant lands obtained in this way far out-value any amount of written description and pencil sketches. At the last exhibition at Pall Mall there was no exhibit more remarkable than Mr. J. W. Sindt's series of photographs in New Guinea, a country hitherto very little explored. Take only two instances. We are accustomed to think of lake-dwellings as belonging altogether to prehistoric times; but here was a lake-dwelling of to-day, stretching, with its inhabitants, over the broad waters of a lagoon. Not very far away was a picture of a hut-like human dwelling, perched like a gigantic nest in the branches of a tree. Now if a traveller had come home and simply described these things, would it not have been insinuated that he was making an unscientific use of his imagination? The evidence of photographs is upon another footing.

It is, however, in the form of photo-mechanical printing processes that the utility of photography is most strongly marked. Photogravure, especially when used in conjunction with orthochromatic processes, is rapidly distancing its older rivals, engraving and etching, as a method for the accurate reproduction of drawings and paintings of all kinds. Collotype, when used in the hand-press, yields results little if at all inferior in point of delicacy; when used with the steam press, produces excellent results with such great rapidity and at such a low rate that it forms an economical process for the illustration of catalogues and for similar purposes. To photo-zincography we are mainly indebted for the accuracy and cheapness of our smaller scale Ordnance maps. Photo-zinc blocks, both for line and half-tone subjects, are very largely employed indeed. With the former excellent results are obtained, even in the reproduction of drawings full of complicated detail; but a great deal has still to be done before half-tone blocks can be regarded as equally satisfactory. In this, and indeed in almost all photo-mechanical printing processes, we, in this country, are still behind our foreign competitors. All the processes alluded to, and likewise photo-lithography and Woodburytype, are very largely used for the illustration of books of all kinds, the block processes being generally adopted for ordinary work, since the illustrations can be printed along with the type. The great increase of illustrated periodicals may in fact be attributed, in a great measure, to the development of these processes. Both line and half-tone blocks are used, for instance, with great success by such publications as the *English Illustrated Magazine*, *Harper's Monthly*, and the *Century Magazine*, to say nothing of well-known periodicals like *Punch*.

Photographic prints are largely used in the form of transfers in the decorative arts, and notable for the decoration of pottery, and photo-etching processes are used for such purposes as the engraving of the rollers used for calico printing, &c. Another application of photography, which at first sight might seem of minor importance, but is really of very great practical value, is the reproduction of engineer's drawings and plans by the cyanotype or Prussian blue process. And lastly, this summary would be incomplete if no reference were made to the extensive employment of photography all over the civilized world for the detection of criminals and the prevention of crime.

One of the great advantages of many of these processes is the cheapness of the results and the rapidity with which they can be produced, two very strong recommendations to popular favour in these times of high pressure.

So far photography has been treated entirely as a method of reproduction. a register of facts, and from this point of view its value is indisputable. How far can it claim to be regarded as a method of creation, or in other words, as a fine art? This is a question of an entirely different character, and one on which I speak with much diffidence. In fact, I should not venture to deal with it at all were it not that I am able to refer to photographic pictures which are, or ought to be, well known, and which may safely be left to speak for themselves.

In order that any method of production, pictorial or otherwise, may serve as a process of fine art, it must not be automatic and mechanical, but must be so far under the control of the man who employs it, that he can bring the result into more or less complete agreement with the conception existing in his mind. Now, to talk of photography as a merely mechanical art, is simply to display ignorance which self-respect would seek to conceal. The character of plate; the time of exposure; the manner of development; the time of the year; the hour of the day; the point of view; the introduction of figures or otherwise, their pose and grouping; the character of the lens used; the method of printing, and the modification made in it—all these are under the control of the operator, and upon these the character of the result depends.

It is quite true that much of the photography that one meets with is not artistic, but that is equally true of very many paintings and drawings, and it does not follow that photography is incapable of artistic results, as many people too hastily assume. In this, as in so many other instances, it is not so much the method, as the man who uses it, that determines the excellence or otherwise of the result.

The reason for refusing to photograph the rank of a fine art in 1873 were summed up by no less an authority than M. P. G. Hamerton, in the following statements. (1) It is false in local colour, putting all the lights and darks of natural colours out of tune. (2) It is false in light, not being able to make those subdivisions in the scale which are necessary to attain relative truth. (3) It is false in perspective, and consequently in the proportions of forms. (4). Its literalness and incapacity for selection and emphasis are antagonistic to the artistic spirit. He finally summed up the matter by asserting that photography was not a fine art and could not be made one.

However true these criticisms may have been in 1873, they are not applicable with anything like the same force, if indeed they are applicable at all, to the photography of the present time. It is in the highest degree probable that they will be altogether inapplicable to the photography of the future. The first objection—*i.e.*, the falsity in local colour, which was perfectly sound at that time—has, to a great extent, been removed by the introduction of orthochromatic methods, and the defect may fairly be expected to disappear entirely as these methods are developed. The correct rendering of gradations of light and shade, apart from the effect of colour, is a matter of exposure, development, and the character of the emulsion, and it is not difficult to find examples in which a wide range of tones is represented in a very satisfactory manner. Falsity in perspective, and in the proportion of forms, is apparent only, and depends on the position of the eye from the picture. Whenever it is met with, it results from the use of short focus lenses, and can be easily remedied by the use of lenses of sufficient focal length. Three objections out of the four have been deprived of their foundations by improvements in the methods of the art, and by increased knowledge of its capabilities. The remaining objection is of a somewhat different order.

It has been contended that art is but an accurate representation of nature, and if this be true, how can the rank of fine art be denied to photography? To take only two examples: What other method can represent with equal success the intricate grace of a leafless tree, or the ever-changing beauties of the clouds? But this definition would not be generally accepted as satisfactory. It would be denied by many that art was necessarily a representation of nature at all, and even if the need of truth to nature were admitted, the truth of idealised, and not of literal representation, would be implied.

What the artist really tries to represent is not so much the thing itself, be it animal or landscape, sea or sky, as the impression which the thing produced on his mind; and in order to convey this impression to the observer, he selects this and rejects that, emphasises one point and tones down another. He likewise endeavours to put into his picture that undefinable something which is recognised as characteristic of the best work, and which, for want of a more precise term, is generally spoken of as "feeling" or sentiment. Upon the extent to which photography lends itself to similar treatment and the production of similar results, its title to the rank claimed for it must largely depend.

In the matter of selection and emphasis it must be conceded that photography is much less elastic than painting. A photographer cannot always leave out an unsuitable object; he cannot alter form; he cannot at will increase the apparent size of a thing. It would be wrong to conclude, however, that he is altogether at the mercy of his subject. In portraiture, the pose, background, mode of lighting, and in fact almost everything, is under his control. In outdoor work the point of view can be altered, and the conditions of lighting selected in order to get the best result. The introduction of a figure suitably posed and lighted will often give the required emphasis. Careful and thoughtful printing will likewise do much towards the attainment of the same end. Selection and emphasis in photography may be comparatively difficult, but it is not impossible.

To put sentiment into a photograph is more difficult than to put sentiment into a painting, because the methods and conditions are less elastic. This "feeling," however, is painfully absent from many paintings, and may, in fact, be taken as characteristic of high-class work only. To obtain it in a photograph may, therefore, be looked upon as a considerable artistic achievement. And can it not be done?

Is there not sentiment, and sentiment in a high degree, in many of Sutcliffe's studies? The cold, misty, autumnal evening, with the breeze which will soon tear the few remaining leaves off the trees; the wild, wintry-looking sky, harbinger of the wind that shall sing the dirge of the wreck on the beach; the rapidly coming twilight, bringing rest from toil to both man and beast; are not these successfully and admirably rendered? Take as another example Tolly's "On the Lonely Shore," with its harmonious composition and chiaroscuro. Observe how true the picture is to its title and the idea which the artist wished to convey, and notice especially the emphasis which is gained by the skilful introduction of the figure. Again, in Green's photograph of "The Head of Buttermere," what a capital picture is made out of the simplest materials, and how admirably the height of the mountain, the loneliness, and the general atmospheric effect are portrayed! And last, but not least, is there not feeling and harmony to at least the same extent as in many paintings in many of Emerson's studies in the Norfolk Broads? These examples are not cited for the purpose of making invidious distinctions, but because they are recent and are familiar to most lovers of photography? Are they not enough to show that in landscape work at least the best photography—and it is on the best that judgment must be based—is truly artistic? What painter has done anything much better than Mayland's wonderful photograph, "There's Sorrow on the Sea"?

When we pass to genre pictures and portraiture, surely the case is still stronger. Here the photographer has matters more under his control. Is there not artistic treatment of a very high order indeed in H. P. Robinson's "Dawn and Sunset," "When the Day's Work is Done," and "Wayside Gossip," to say nothing of his numerous other productions? Are not Sutcliffe's studies of fisher folk as admirable as the majority of similar studies done with the pencil or brush? Do we not yet remember Malby's "Strengthening the Understanding" and Gridley's "The Good Flask"?

In portraiture it must be admitted that the great bulk of the work done is bad—bad technically, worse artistically—but then this is equally true of much portrait painting. The capabilities of an art are, however, judged from its best results, and not from the worst. Photography is the method of portraiture for the million, and this alone would insure its continued existence. But it has higher claims, and people rightly set considerable value on a photographic portrait by one of our most eminent artists in this branch. Truth, which is of great importance in these cases, is not difficult to obtain, nor is it excessively difficult, by proper treatment, to throw into the picture some of that sentiment and character which is essential to all good portraiture. Referring now to examples in the late exhibition at Pall Mall, it is safe to say, in the first place, that those who examined Mendelssohn's grand head of Mr. Perigal will not soon forget it. Is there not, too, a peculiar charm about Hollyer's portrait of Miss Terry, in spite of some criticisms which might be made respecting the lighting of the face and its background? To go a little further back, some at least will remember Byrne's "Lady in a Grecian Dress." It is not very rash to assert that there is as much "fine art" in these examples (and in many others which might have been mentioned if these had not come first into mind) as in not a few of the portraits which are seen at the Academy. How many painters of to-day have done anything more vigorous and characteristic than Debenham's head of F. Barnard?

It is not necessary to cite further examples. The claims of photography to be recognised as a fine art are, as a matter of fact, being gradually admitted—a result due entirely to the labours of the minority of the craft, who bring to their work sound, artistic training and a careful study of its difficulties and capabilities. Already the leading newspapers criticise the exhibition in Pall Mall on the same footing, so far as the pictorial part of it is concerned, as they criticise an exhibition of drawings or paintings. It is unfortunate, however, that the critics do not always display even a decent knowledge of the art which they criticise, and particularly of the special technical difficulties which have to be contended against.

I should be sorry to weaken the argument by seeming to claim too much. It would be ridiculous to assert that photography is entitled to equal rank with painting. Some things it can do which painting cannot do, but in most respects it is undoubtedly inferior to the older art. It lacks at present, and probably for some time to come, the power and mystery of colour. It is much less elastic, and, whilst answering to a very considerable extent to the will of the artist, it does not, at present at anyrate, leave him that complete control which is essential to the production of the very highest work. Moreover, it imposes strict and somewhat narrow limitations both as to choice of subject and the mode of treatment. Limitations of a similar kind are, however, inseparable from other graphic arts, and painting itself is not altogether untrammelled. To admit, as we are bound to do, that photography does not rank with the very first of the fine arts is a very different thing from admitting that it is not a fine art at all. Such an admission I, and think you also, would altogether decline to make. Holding then this belief, let us not be satisfied with mere technical efficiency, but let us each endeavour, by systematic cultivation of whatever artistic faculty may be in us, by careful and painstaking study of every subject we undertake, to make good individually our claims to be in reality, and not merely in name, artists in photography.

Notes.

"Photography in the Printing Press" is the title of a paper which is to be read by H. Trueman Wood at the Camera Club on Thursday, January 12th. The paper will, we have reason to believe be very fully illustrated by specimens, not only of the most important processes now worked, but by the newest, and those merely in a semi-experimental stage. Mr. Wood ranks as one of the few experts in this particular line, hence his lecture will be of considerable interest.

Strange it is that the amateur photographer, as a rule, almost completely neglects these photo-mechanical processes, which alone can serve when large numbers of unfading photographs are wanted.

Thomas Annan—one of the old workers in photography, and a pioneer in carbon printing—died on the 14th inst. Of late years Mr. Annan devoted much attention to photo-engraving, and among the most recent work executed by his firm (Annan and Swan) may be mentioned the untouched portrait of her Majesty, which forms the main illustration of the YEAR-BOOK OF PHOTOGRAPHY for 1888. It was, we believe, in 1857 that Mr. Annan commenced business in Glasgow, and during his business career he gathered around himself a large circle of friends who thoroughly appreciated his excellent personal qualities.

The Sugar Bounty Conference, the *Sunday Times* says, did not adjourn for Christmas without being photographed, and the time may come when parliamentary committees will, during the luncheon hour, go on the terrace and be photographed by the operator who, in the summer, is always to be found there with his camera in readiness. We should not be surprised if the fashion ascended as high as a Cabinet Council, and as low as an Old Bailey jury. In the latter case a prisoner who was found not guilty might like to have the portraits of the twelve men who well and truly tried and let him off.

An example set fifteen years ago by the Tyneside Naturalistic Club of Newcastle, in having all the fine trees in Northumberland and Durham photographed, has borne good fruit. The same work is now being done in New Jersey and Massachusetts, and the series is being published in six shilling parts, a much larger series being contemplated so far as Massachusetts is concerned. The *New York Nature* warmly approves this photographing of trees remarkable for perfection of growth, age, or historical associations, and thinks it should be cultivated by naturalistic and photographic societies. From an artistic point of view much benefit would arise. Of course, no painter would nowadays venture upon the unmeaning mass of wool which did duty too often for foliage half a century ago, but he has yet a good deal to unlearn in respect to tree form. There are no lack of photographs to be purchased which contain trees, but special photographs taken for the sake of the trees alone—always excepting the much photographed Burnham Beeches—are, we fancy, not numerous. It is needless to say that to do full justice to a tree, the lighting, the period of the year, the time of day, and the aspect must all receive attention. Photographs of this kind should take their place beside the photographic studies of animals which almost every artist possesses, and ought to command a ready sale.

President Carnot has consented to be photographed, but not by a professional. The operator is his friend the poet artist, Etrienne Carjat. The President was taken in several positions, and all have been pronounced exceedingly satisfactory. The negatives are being printed from as rapidly as the weather will permit, and copies will be promptly sent to adorn the Government offices, from the walls of which the photographs of the late Presidents have already been removed. They certainly order these things much better in France. Imagine Lord Salisbury sending round batches of his photographs to the Foreign, Home, and War Offices, to take the place of Mr. Gladstone's, and *vice versa.*

An interesting discussion on certain phenomena in connection with photographing the stars took place at the last meeting of the Royal Astronomical Society. Photographs had been taken on curved plates 6 inches square, the radius of the curve being about 22 inches, corresponding to the radius of curvature of the field, which contained all the circles of least confusion. Some of the photographs were taken in the centre of the plates, and some at the corners, and the experiments proved that as you go out from the centre of the field the circle of least confusion was not by any means a circle as is usually assumed, but that it was a kite-shaped cross, one of the arms of which was curved. Capt. Abney thought the distortion was due to dispersion of light, owing to the thickness of the gelatine film, which could now be measured by hundredths of an inch, whereas a collodion film had to be measured by thousandths and even ten thousandths of an inch. Mr. Ranyard and Mr. Common differed from Capt. Abney, and gave results of experiments which went to prove that the distortions were due to optical causes. The Astronomer-Royal stated that the experiments would be repeated on flat plates.

Photographic astronomers have need of patience if all are tried in the same way as was Dr. Gould, director of the National Observatory at Cortoba, in the Argentine Republic. Hubert Sadler, F.R.A.S., in a paper on "Photographing the Stars" in this month's journal of the Liverpool Astronomical Society, relates that Dr. Gould having acquired a telescope, made for Dr. Rutherford by Alvan Clark and Son, provided himself with a photographic assistant, and impatiently awaited the arrival of the instrument. On the latter making its appearance it was found that one of the lenses was broken in two parts, but Dr. Gould, undismayed at this catastrophe, managed, by adjusting the broken lenses, to obtain a few photographs of the moon and southern star clusters, and ordered, at his own expense, a fresh lens to replace the injured one. But even when the new lens came to hand but little work was accomplished. The assistant proved to be worse than useless for the purpose for which he had been engaged, as he employed the materials provided him in taking photographs on his own account of terrestrial instead of celestial beauties, and the few stellar photographs he did take turned out to be utterly worthless, owing to the splitting of the collodion film. But this was in 1871, and photographic assistants with a taste for astronomy must have been rather scarce at that time. It is gratifying to learn that the successor of this gentleman turned out much better, and that some exquisite photographs of the moon and stars were obtained.

There is a fashion setting in for photographic albums apparently designed especially for the reception of portraits, the originals of which are in sympathy with the leading idea of the album. One of these already advertised is called the "British Marine Album," the pages of which contain coloured chromo designs of ships and flags surrounding the cabinet and carte-de-visite apertures. We presume this album is intended solely for the photographs of those connected directly or indirectly with the shipping interest. Another, the "Victoria Album," contains representations of some of the principal incidents in the life of the Queen, and is no doubt meant exclusively for ultra loyalists. If the fashion spreads, we shall possibly have Conservative, Gladstonian, and Parnellite albums, though this is a contingency which is to be dreaded rather than welcomed, unless, indeed, an album of each kind is kept in every household. To be forced to declare one's political principles, now that party feeling runs so high, is not conducive to the preservation of friendship. Besides, these illustrated and coloured albums are generally in very bad taste, and often entirely destroy the effect of the photograph. Why manufacturers cannot be contented to leave photographic albums to photographs alone is a mystery.

FERROTYPES.

BY E. P. GRISWOLD.*

These beautiful pictures, on account of their cheapness, are frowned upon by a large class of photographers, who speak of and treat them with contempt, thus giving the impression that they are inferior to a photograph. Many, if not most, of the wealthy patrons of photography have the same erroneous idea of the ferrotype. In reality a good ferrotype is far superior to the average run of photographs, and the reason is very simple. In a ferrotype all the characteristic features of the sitter are preserved—not a wrinkle, mole, or freckle is lost. No retoucher's sacrilegious hand can mar in the least the faithful likeness. In a negative every wrinkle or line in the dear old mother's face is removed, and instead of the face we love so well, we look upon —what? Nothing but an exhibition of the retoucher's skill—beautiful as a piece of mechanism, but utterly worthless as a true likeness. Good, yes, beautiful ferrotypes can be made by almost any professional photographer with no trouble whatever. It is more difficult for the amateur, but not enough so to prevent his undertaking it, although it may be a long time before many indulge in it.

For the benefit of those, however, who wish to try it, I will give a few hints on the subject with the hope that it may lead many to undertake the operation. Any ordinary bath-room can be utilized as a dark-room, and, with a little care, without fear of injury to carpets or wood work. Old newspapers are generally very plentiful, and by spreading them around, all danger of stains may be easily overcome. The cost of a ferrotype outfit is very small, and need not deter any one on that account.

The articles needed to make a ferrotype outfit for an amateur are:—

A plate-holder to fit and focus with camera already in use, 1 hard rubber bath and dipper, 1 hard rubber tray, 1 bottle ferrotype collodion, 1 bottle ferrotype varnish, 4 ounces crystallized nitrate silver, 1 pound double sulphate of iron and ammonia, 1 pound acetic acid, No. 8, 1 ounce nitric acid C.P., 1 dozen 10 by 14 ferro plates, 3 or 4 quart bottles.

You are now ready to prepare the silver bath. This should be about 40 grains strong, that is, every ounce of water should contain 40 grains of nitrate silver. Take—

Water (distilled preferred)	24 ounces
Nitrate silver	2 ,,
Nitric acid...	2 drops

When thoroughly dissolved, filter carefully. Pour a sufficient quantity of the silver into your bath-dish to fully cover the plate. Carefully clean a glass plate of as large size as will go in the bath, coat it with the ferrotype collodion, immerse it in the silver bath, and leave it there over night. This is the simplest way to iodize the silver solution. To coat a ferro plate with collodion, take it by one corner, carefully dust it, and then pour the collodion gently and rapidly on the centre of the plate. Let it flow first to the corner diagonally opposite to the one by which it is held, then to the left-hand corner, down to the corner held, and back into the bottle from the lower right-hand corner. Rock it quickly back and forth while draining into the bottle to prevent lines. Place on the dipper, and plunge it into the bath. The plate must be left in the bath till all the greasy appearance is gone. Draw it carefully out of the bath, let it drain for a minute, then place in the plate-holder, putting a clean glass plate behind it. Expose from three to ten seconds, according to the light or lens.

A good developer is made as follows :—

Water	64 ounces
Double sulphate iron and ammonia ...	4 ,,
Acetic acid, No. 8	4 ,,
Yellow rock candy	½ ounce

This developer can be used again and again by developing over a rubber or porcelain dish, and filtering it. To develop a plate, take by the same corner as when coated, pour about one ounce of the developer over the plate quickly, and be sure it is done evenly, holding it so that sufficient solution remains on the plate to cover it. Let the dark portions of the image show up pretty strong, then wash thoroughly, and fix in a saturated solution of hypo. After the plate is fixed, wash carefully, dry by gentle heat, and varnish it.

The expense is very small, and after a few trials the manipulation is easy. One thing, however, must be borne in mind, that is, absolute cleanliness. No trace or taint of hypo or iron must be allowed near the silver bath.

The light used to develop by can be either an ordinary lamp or gas flame, or a window covered with yellow glass or paper, as the collodion film is much less sensitive than even the slowest make of dry plates.

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* Reprinted from the *Photographic Times.*

Patent Intelligence.

Applications for Letters Patent.

17,133. Alfred Philip Wire, 1, Seaton Villas, Birkbeck Road, Harrow Green, E., Essex, for "An improved phenakistiscope, or revolving disc for making and showing optical illusions."—Dec. 13, 1887.

17,296. William Prestwich, Warmington House, High Road, Tottenham, N., for "A registering photographic printing frame."—Dec. 16, 1887.

17,341. George Hughes, 38, Chancery Lane, W.C., for "A combined and portable automatic apparatus capable of exhibiting at day or night a series of views, photographs, pictures, or other matters of public interest consecutively."—(*Victor Bonnet*, *Hippolite Lissagaray*, *Armand Richard*, and *Alfred Richard*, France.).—Dec. 16, 1887.

17,461. James Hines, Edward Howell, and Alfred Howell, 96, Buchanan Street, Glasgow, for "Improvements in the modes of, and means or apparatus for taking and producing photographs and in appliances connected therewith."—Dec. 19, 1887.

Official Abstracts of Accepted Complete Specifications.

541 of 1887. Ashford. "Cameras [including lenses and lens fittings]."—Back folds down on bellows when detached from front; front folds over back to protect focussing glass.

1,533 of 1887. Lancaster. "Cameras [including lenses and lens fittings]."—Front held in fork mounted on slide with racks and pinion, which slide can be clamped at any point of tail board; fecussing arrangement.

1,533 of 1887. Lancaster. "Change boxes and slides."—Fixing dark slide to camera horizontally or vertically by notches in the corners and excentrics; inner hinged carrier.

2,662 of 1887. Warnerke. "Sensitised plates, films, &c."—Soluble gumming substratum between paper and sensitive film which is transferred to glass for development.

2,382 of 1887. Perken. "Shutters."—Slide moved up and down by half revolution of crank acting through three levers or links.

2,763 of 1887. Atkinson. "Developing, fixing, washing, and retouching."—Bottom of developing dish formed by photographic plate clamped between elastic packing of two hinged frames. (See illustration on p. 66 of the Year-Book for 1887.)

Specifications Published.

1830. William Edwin Moss and John Mitton, Birch Passage, Alfreton Road, Nottingham, Machinists, for "Improvements in bearings for photographic rolling presses, rolling machines, and the like."—Dated 5th February, 1887.

In photographic rolling presses, rolling machines, and the like, each bottom bearing constructed according to this invention, consists of two friction rollers working in recesses or slots, and revolving on pins attached to the body of the machine. The top bearing is formed by two friction rollers, but to a loose cap, and is arranged in the same manner as the bottom bearing.

1079. Claude Raymond, of 9, Boulevard Poissonnière, Paris, France, merchant, for "Improvements in obtaining prints with the aid of photography, and in the preparation of the materials and in apparatus to be employed therein."—Dated 24th January, 1887.

The Patentee says—

My Invention, which enables me to employ a sheet of gelatine directly as a surface or plate for printing from, is based on the use of gelatinized parchment paper (or other gelatinized surface) similar to that generally employed for autocopy in black. This gelatinized parchment paper having been prepared in a special manner to adapt it to its particular use, is immersed in a sensitizing bath of bichromate of potass, perchloride of iron, nitrate of uranium, or other suitable material. When it has been sensitized it is left to dry in the dark, after having been applied to a talced glass (glace talquée) the gelatine against the glass. This sheet of bichromatized parchment paper is afterwards placed in a photographic frame upon the negative to be reproduced, and the whole is exposed to the light. The light having sufficiently impressionized the bichromatized gelatine of the paper, the paper is removed therefrom in water, and there is thus obtained on the sheet of paper, in intaglio and relief, the image to be printed. In order to employ this surface or plate of gelatinized paper for direct printing, I impart to it a degree of humidity varying with the accentuation of the reliefs that it is wished to obtain, and I stretch it in a special frame in which the desired humidity must be maintained, and in which it serves directly as a printing surface.

12,292. Arthur Marriott, of 13 Swann Street, Loughborough, in the County of Leicester, Coppersmith and Ironplate Worker, for "Improvements in washing photographic prints and in appartus therefore."—Dated 10th September, 1887.

The arrangement comprises the use of a cylindrical vessel of suitable dimensions, and constructed of any suitable material at or near the lower end of which is fixed a water-tight bottom; at the bottom of this vessel, and rotating close to it, is a water wheel with a convenient number of arms; this wheel is a little less than the inner diameter of the vessel, and is secured to a bottom, and an upper bearing formed in a bar placed across the top of the vessel.

This wheel is driven by a number of water jets set at a suitable angle on the bottom of the vessel, each jet being supplied with water from a central reservoir underneath, the bottom provided with a supply pipe or by any convenient arrangement.

Immediately above this water wheel is a false bottom resting on bearings secured to the sides of the vessel. It is formed in the shape of an air propeller with a convenient number of propellers, and to prevent the prints from slipping through them, the space between each is filled with a perforated metal plate placed in a vertical position.

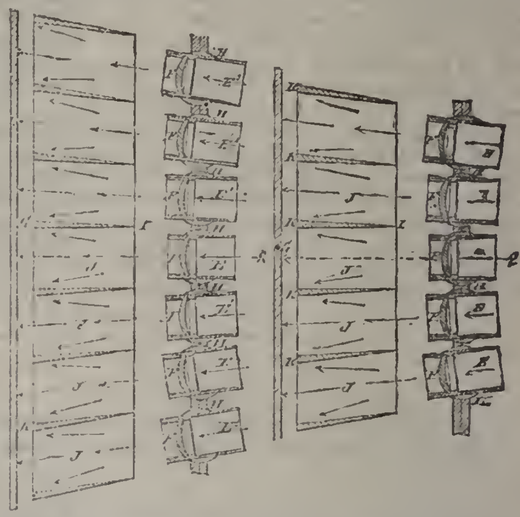
To prevent the prints from collecting in the centre by the action of the water, the centre space above the false bottom is occupied by a hollow perforated cone; and to prevent the vessel from overflowing there is an opening in the side near the bottom connected with a pipe which is carried up the side to a convenient height, and then bent down again in the form of a syphon; at the upper bend of this pipe or syphon is a small air inlet provided with a tap, and by opening or closing this inlet the pipe may be used as an overflow pipe or as a syphon to empty the vessel.

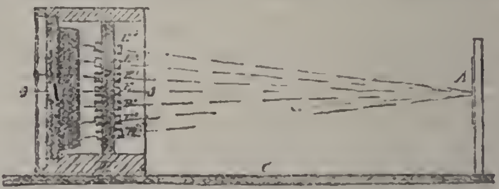
The action of the apparatus is as follows:—The prints to be washed are placed in the vessel above the false bottom, and the water entering by the jet turns the water wheel, the action of the water wheel forces the water through the false bottom in waves in a circular direction, and the whole of the water in the vessel is kept moving by this action, the prints are gently turned over and over, and are kept constantly in motion until they are removed.

Patents Granted in America.

373,404. Orrin L. Hulbert, St. Louis, Mo., assignor to Hulbert Brothers, same place, for "Apparatus for making multiple photographic sheets."—Filed December 26th, 1885. Serial No. 186,734 (No model.)

Claim.—1. In combination with a shield having a number of radially-inclined openings, a number of adjustable lenses, substantially as shown, and for the purpose set forth.





2. In a photographic apparatus, the combination, with a shield, of lenses having universal adjustment, substantially as described.

3. In a photographic apparatus, the combination, with a shield, of a number of tubes having lenses, and ball-and-socket connections between the tubes and shield, substantially as described.

Correspondence.

THE PHOTOGRAPHIC SOCIETY.

Sir,—I have just read your report of the proceedings at the last meeting of the Photographic Society of Great Britain, and regret very much that I was unavoidably absent, as I might have saved the President from the extreme annoyance—to use a gentle expression—to which he was subjected, by making the statement which I will now, with your permission, lay before your readers.

At the meeting on November 8th I read out, as usual, the name and address of each candidate for election, with the name of the member proposing him from personal knowledge. The chairman then stated, as usual, that all the candidates would be ballotted for *en bloc*, but that if there were any considerable number of black balls (one in five excludes) a ballot would be taken for each candidate separately. The attendant then took round the ballot box, and while the voting was in progress Mr. Wollaston handed me a card with the following words written in pencil : "—— is a mistake," naming one of the candidates. I at once got up, followed the attendant, took from him the certificate of the candidate in question, and not seeing any mistake in it I showed it to Mr. Wollaston and asked him what was wrong. He then told me that he objected to the candidate. I said "Oh, is that it? Well, then, put in your black ball," or words to this effect. He replied that the ballot box had already passed him. Subsequently, after the chairman had opened the ballot box, and finding no black balls at all, had declared all the candidates duly elected, Mr. Wollaston complained that sufficient notice was not given that the candidate in question was about to be balloted for. It was suggested by some one that the candidates' certificates should be posted up beforehand, so as to give members an opportunity of examining them. General approval was expressed of this plan, and the matter then dropped.

In what I have stated I wish to emphasise the fact that no protest of any kind reached me *before* the ballot began ; that after it had began Mr Wollaston left his seat, and handed to me a card bearing the four words quoted above, and that I took them to imply some clerical error in the candidate's certificate. No one could suppose at first sight they were intended as a formal protest against his nomination, and I submit that they do not constitute a protest at all. I wish further to say that the system of election of candidates which was followed on this occasion was that which has always been in use in this Society, and that there was no attempt to hurry them through. The names were, I think, read out sufficiently clearly for every one to hear, and several minutes elapsed between the time of naming the candidate in question and the ballot being started.

Mr. Wollaston is reported to have said at the last meeting (December 13) that he handed in a written protest to Mr. Cocking, written in ink in his presence, an hour before the meeting (on Nov. 8) began. It is impossible to prove a negative ; but Mr. Cocking has accounted to me for the whole of his time after five o'clock on that evening, when the Exhibition closed, till 6.45, when the council meeting began, at which all the candidates' certificates were signed ; at eight o'clock the council adjourned for the meeting upstairs, and Mr. Cocking assures me he has no recollection of seeing Mr. Wollaston at all till then, or of receiving any document from him. It should be noted also that Mr. Wollaston asked a question of the proposer of the candidate he objected to, implying a doubt as to his identity, *after* the ballot was over.

I am glad that the majority of the meeting on Dec. 13 regained sufficient confidence in the honesty of the President and Secretaries to rescind their hasty vote, even in the absence of the above statement of facts.—I am, sir, yours, &c., W. F. Donkin, Hon. Sec. P.S.G.B.

December 17, 1887.

ORTHOCHROMATIC PHOTOGRAPHY.

Dear Sir,—I should not venture to again occupy your space were it not that the letter of Messrs. B. J. Edwards and Co. in your issue of the 16th contains imputations as to my accuracy, to which I must ask your permission to reply.

In the first place, it is stated that I am entirely mistaken as to the superiority of the bath process, "which, at best, is only an imperfect and roundabout way of producing results which are better obtained by the use of an emulsion made isochromatic in the first instance." What I actually said was that there was a considerable balance of evidence in favour of the superiority of bath processes over those in which the dyes are added to the emulsion.

In one of Eder's own articles on orthochromatic photography in his *Jahrbuch f Photographie*, 1887, I find (pp. 309) : "Am einfachsten ist das Baden gewohnlicher Gelatinetrockenplatten in der Farbstofflosung," and further, "Schumann constatirte zuerst October 1885, das fertige Emulsionsplatten, in Eosinglosung gebadet, viermal gelbempfindlicher sind as dieselbe Emulsion flussig mit der Farbe gemischt ; ebenso verhalt sich Cyanin. Prof. Vogel bestatigte dieselbe Angabe fur Azalin (Nov. 1885) und Dr. Mallman und Seolik fur Erythrosin." Further (*Sitzb-der-kais Akad der Wissench. Wien*, 1885, pp. 1347) : "Zu meinen Versuchen dienten Bromsilbergelatineplatten, welche in der Regel in der Farbstoff-losung gebadet wurden." It seems, therefore, that on the one side we have Eder, Vogel, Schumann, and Mallman and Seolik, to say nothing of Lohse, Engler, and others ; whilst on the other side we have Messrs. B. J. Edwards and Co. and their *ipsi dixit*. It is at any rate some comfort to fine oneself erring in good company.

It is further stated that my experiments are evidently based on the mistaken theory of so-called "optical sensitisers." Now Vogel and Eder have both proved that the film containing the dye does absorb certain rays which it would not absorb if the dye were not there, but I have contented myself with describing the views of Abney, Vogel, and Eder (pp. 147 and 148) without advancing any theory of my own as to the way in which the dye acts. I used the terms "dyed" plates and "undyed" plates as a concise and sufficiently intelligible way of distinguishing plates which had been treated with a dye from those which had not. The assumption that I shall be surprised to learn that the colour-sensitive compound can be separated from the dyed or stained gelatine, and re-emulsified without losing its orthochromatic properties, is entirely gratuitous, and may probably be taken as typical of the accuracy of Messrs. B. J. Edwards and Co.'s acquaintance with what I have really written. The fact of the combination of the dye with the silver salt, and the impossibility of removing it by washing, are both to be found on p. 148 ; and there are several references to the silver derivatives of the eosin dyes in other parts of the articles. The use of alcohol and the washing of the plates after bathing I omitted purposely, following in this respect the lead of the authorities whom I have already quoted. The "other important matters which are clearly indicated," and which I am likewise said to have omitted, are not to be found in my official copy of the specification (see p. 708). Photographers who were at the Royal Society's soirée on June 8th, Photographic Convention on July 7th, or the Photographic Club on September 28th, are more competent than I to judge how far the process I used gives satisfactory results.

Messrs. Edwards and Co. also say that it is not true that success in the bath process depends mainly upon the proper proportions. I never advanced this statement as a discovery of my own, although it is supported by the results which I obtained. Eder says (*Sitzb. d. k. Akad d. Wissench. Wien*, Pt. 2, 1884, pp. 20, and *Ausfuhrliches Handuck III.*, p. 126) : "Die richtige Concentration des Farbstoffes ist das erste Erforderniss des Gelingens, was ich als bekannt voraussetze." A similar statement is made by Vogel (*Photographie in richtigen Ton-verhaultnissen*) and also by Schumann (*Anthony's Bulletin*, 1886). Again it is Eder, Vogel, and Schumann on the one side, and Messrs. B. J. Edwards and Co. on the other, and again I prefer the company of the sinners.

Messrs. Edwards and Co. are probably the only people in the world, with an acquaintance with orthochromatic photography, who hold the opinion that "the subject has been fully worked out."

In the second and concluding paragraphs of their letter there are *ex cathedra* statements to the effect that "it would be easy to show that Mr. Bothamley's paper, as it now stands, is full of misleading statements and erroneous conclusions," and further, "there are many other errors . . . . which . . . . should be corrected." Statements of this kind are altogether unjustifiable, and, I venture to add, altogether valueless unless they are supported by evidence. Perhaps in their zeal for the advancement of orthochromatic photography Messrs. Edwards and Co. will undertake this easy task, and will be so kind as to specify the misleading statements and erroneous conclusions to which they refer, and to bring forward evidence proving their inaccuracy. I shall be glad to give their objections the most careful consideration, but failing that, or a withdrawal of the imputations, I shall decline to take any notice of any further communication on their part, and shall be quite content to leave the matter with those who have read my articles or have repeated my experiments.

The gist of the complaint lies in this, that up to the present I have chosen to confine my attention to bath processes, and have made no special mention of the Attout-Clayton process of adding the dye to the emulsion. I may add—though Messrs. Edward and Co. make no complaint on that score—that I have likewise said very little about azalin, or the processes for preparing plates which can be used without a screen.—I am, yours faithfully,

C. H. Bothamley.

STRIPPING FILMS PATENT.

Dear Sir,—In reply to the Autotype Company's second letter regarding the above, in which they ask "an authoritative statement as to whether a set of operations, &c." Anyone of business habits really desiring information on such a subject, I surmise, would have obtained the opinion of a Specialist in Patent Law--Mr. T. Aston, Q.C., for example—instead of taking up your valuable space in attempting to raise a discussion which would be futile between non-experts in the law relating to patents.—I am, yours very truly,

E. W. Foxlee.

22, *Goldsmith Road, Acton, W., Dec.* 19, 1887.

THE OPTICAL CENTRE OF A LENS.

Dear Sir,—Mr. W. G. Wheeler writes a long letter in your last under the above heading, and he has taken a chapter of my "Lectures" as the peg to hang his remarks on. So far as I am concerned, he is quite welcome to make this use of what I have written. His remarks about optical centres, though apparently directed towards me, are really, I believe, not meant for me specially, but to be applied to the current notions as generally set forth in text-books and taught by those who teach elementary optics.

The aim of that part of my Lectures which deals with optical matters is to give a few fundamental ideas that shall be useful in themselves, and form, if necessary, a fitting introduction to the further study of the subject. I have no time to discuss those refinements that Mr. Wheeler refers to, and am most decidedly of opinion that broad generalities, though they have their exceptions and qualifications, are stepping stones to truth, and mislead only those who carelessly or wilfully go astray.—I am, dear sir, yours faithfully,

Chapman Jones.

Proceedings of Societies.

Photographic Society of Great Britain.

An adjourned special general meeting for the final acceptance of the proposed new laws took place on Tuesday, the 13th inst., at the Gallery, 5a, Pall Mall East, **James Glaisher**, F.R.S., President, in the chair.

Rule I.—"The Society"—read and accepted without comment.

1. The object of the Photographic Society of Great Britain shall be the advancement of photography, and the branches of science and art connected therewith.

A. **Mackie** inquired whether notice of the July 19th meeting had been sent to all the members?

The **Assistant Secretary** replied in the affirmative.

J. **Werge** remarked that if all were notified on that occasion, why not on the second and subsequent meetings?

The **Chairman**: These were adjourned meetings which do not require notice to be sent. He hoped gentlemen would not raise trivial points.

A. **Mackie** said the amended rules, as drafted, abounded in verbal errors: whose duty would it be to re-draft the final code, or who was to be trusted with the responsibility of making the necessary verbal alterations?

The **Chairman** could not answer the question; probably a committee would be appointed to do this work.

Captain **Abney** thought it unnecessary to introduce trivial objections; it would be better to stick to the real business of the evening.

A. **Mackie** was coming to that. At the last meeting a point of importance was, at the suggestion of Captain Abney, referred back to council to formulate details, and this had not been done.

The **Chairman** replied that he would not take the motion.

S. G. B. **Wollaston** drew the President's attention to the fact that the decision to refer the matter to council appeared in the report of the meeting in their journal, which he read.

T. **Samuels** said his object in moving for a committee to arrange the amended rules was to prevent errors such as appeared in Paragraph 5, and other places. He hoped a committee would be appointed.

Rule II., "The Council," was then read as follows:—

2. The government of the Society shall be in the hands of a council, which shall consist of a president, four vice-presidents, a treasurer, two honorary secretaries, and twenty other members of council.

3. At all meetings of the council seven shall be a quorum.

4. The Council shall hold their meetings at such times as they may appoint.

5. The council shall have power to make such regulations for the management of the Society as they shall see fit (not being inconsistent with the laws).

A. **Mackie**, in paragraph 5, wished to insert "byelaws" before regulations, as bye-laws and regulations were not quite the same thing; one might be intended to last for an evening, while the other might be for all time. He also deemed it desirable to limit the powers of the council in appointing committees for any other purpose than that connected with the management of the Society. Committees for scientific investigation ought to be appointed by the members. For instance, he did not think the council should have the power to appoint a committee to investigate the quality of a commercial sample of chloride of gold; and if desired, he would mention that a committee had been appointed for an exactly similar purpose.

The **Chairman** was opposed to anything of a commercial nature being introduced into the Society; the business was to deal with future committees rather than what had taken place.

A. **Mackie**: This limit is making a provision for the future, so that such things cannot happen.

W. **Bedford** supposed every member of council would be glad to shift the responsibility of some of the work.

J. **Werge** moved that "not anyone in trade, or on the staff of a journal, be elected a member of this council." This was not seconded.

A. **Mackie** then moved and W. **Bedford** seconded, "That the council may appoint a committee or committees for any purpose connected with the management of the Society."

The motion having been put to a show of hands, 16 were in favour and 11 against. Carried.

Rule III., "The President," was then read.

6. The president shall preside at all meetings of the Society (other than technical and council), and shall regulate the order of the proceedings.

7. Should the president be unable to attend, one of the vice-presidents shall take the chair; and should neither the president nor a vice-president be present, then one of the other members of the council shall be appointed chairman for the occasion.

8. The president shall deliver an address to the Society at the annual meeting in February.

Agreed to.

Rule IV., "The Treasurer," was read and accepted without comment.

9. The treasurer shall receive all moneys due to the Society,

and shall pay such sums as may be ordered by the council. He shall keep an account of all such receipts and payments, and render such statements to the council as they may require.

Rule V., The "Honorary Secretaries," was read and discussed.

10. The council shall appoint two honorary secretaries. The honorary secretaries shall attend the meetings of the Society and council, and take minutes of the proceedings. They shall conduct the correspondence of the Society, and one of them edit the *Journal*. If requested by the authors they shall read the papers presented to the Society.

11. There may be a paid secretary, who shall be appointed by the council, and shall discharge such duties as the council may require.

Capt. Abney thought it might prove a case of misplaced confidence to say there shall be two honorary secretaries, "and one of them edit the *Journal*." That had better be struck out, also "honorary," and in paragraph 11 insert "assistant" after "paid." He moved this alteration, W. E. Debenham seconding.

E. Clifton and A. Mackie argued in favour of one secretary and an editor.

J. Werge moved an amendment to the effect that there be one secretary and one editor. In the past he said the business had been very well carried on by such men as the late H. Baden Pritchard and others, and he saw no reason for making two secretaries.

The subject was further discussed by W. Bedford, W. E. Debenham, Capt. Abney, and J. Werge, when the following motion by Capt. Abney was agreed upon, there being only two dissentients.

Rule V., "The Secretary."

10. The council shall appoint one secretary, whose duty shall be to attend all meetings of the society and council, and take minutes of the proceedings. He shall conduct the correspondence of the Society, and if requested by the authors shall read the papers presented to the Society.

11. There may be a paid assistant-secretary, who shall be appointed by the council, and shall discharge such duties as the council may require.

Rule VI., "The Auditors," accepted without comment.

12. Two auditors of the accounts shall be elected at the ordinary meeting of the Society in January. They shall audit the accounts to be produced at the annual general meeting of the Society to be held in February. They shall have the power of calling for all necessary accounts and vouchers. No member of the council shall be eligible as an auditor.

Rule VII., "The Scrutineers," was also agreed to.

13. Scrutineers shall be appointed at the January meeting to examine the voting papers for the election of officers, and to announce the result of the election. In the case of the number of scrutineers being rendered insufficient, owing to nominations for council, the council may appoint additional scrutineers.

Rule VIII., "The Annual General Meeting," was briefly discussed.

14. The annual general meeting of the Society shall be held on the second Tuesday in February in each year, at 8 o'clock p.m.

15. At this meeting the council shall submit a report of the Society's proceedings, and a copy of such report, with the audited accounts of the treasurer, shall be sent to every member of the Society, with the notice convening the meeting.

16. Notice of the holding of the annual general meeting shall be sent to every member of the Society by posting it to his registered address, at least seven days, and not more than fourteen days previous to the holding thereof.

A. Mackie had an objection to this rule on account of its utter clumsiness. He saw no reason for separating 8 and 9 into two paragraphs, and the title of general meetings covered it.

Capt. Abney remarked that anything done at a special meeting could be accomplished at an annual general meeting.

The matter then dropped, and the rule was agreed to.

Rule IX., "Special General Meetings," was read and discussed.

17. The council may convene a special general meeting for any purpose whenever they deem necessary.

18. The council shall convene a special general meeting upon a requisition to that effect signed by not less than twelve members of the Society, and stating the purpose for which it is convened.

19. Notice of every special general meeting shall be sent to every member of the Society by posting it to his registered address, at least seven days, and not more than fourteen days, previous to the holding thereof.

A. Mackie moved that the word "council," paragraph 18, be substituted by "secretary." He put this for greater convenience of working. If, to-morrow, a requisition was delivered, the secretary must call a special meeting of the council to fix the date when the special general meeting called for should be held, or he might wait a month or more before doing so. Upon requisition the council were bound to call the meeting, whether it pleased them to do so or not; therefore, the secretary could, if empowered, do the work without their assistance.

W. M. Ashman seconded the motion.

Capt. Abney contended that it would be unwise to make the change. "There was wisdom in the multitude," and it was possible to receive a requisition which would not be of sufficient importance to immediately call a meeting.

T. Sebastian Davis held a similar view.

H. M. Smith did not think it was at all right to delay the calling of a special meeting upon requisition, and every facility should be afforded to bring it about as quickly as possible. The secretary might call it for 9 p.m. after an ordinary meeting had terminated.

The Chairman remarked that ordinary meetings were often continued until ten o'clock and after. They could not have the use of the Gallery as long as they pleased.

S. G. B. Wollaston was of opinion the rule should be altered to secretary instead of council, and a specified time ought to be mentioned.

A. Mackie intended to add a date, as, for instance, "within one calendar month."

Upon a show of hands the motion was lost—13 for, 20 against.

Captain Abney proposed, and T. Samuels seconded, "That within one calendar month after notice has been received" be added to paragraph 18. Carried.

Rule X., "Ordinary meetings of the Society," read and accepted.

20. The ordinary meetings of the society shall be held on the second Tuesdays in the months of November, December, January, March, April, May, and June (or on such other dates as the council may appoint), for the election of members, reading communications, and other business connected with the objects of the Society.

21. The technical meetings of the Society shall be held on the fourth Tuesday of every month, or on such dates as the council shall appoint, for the informal discussion of subjects of photographic interest, under the presidency of a chairman elected at each meeting.

22. Communications intended to be read to the Society should be submitted to the council for approval. Such approval shall not be considered as an endorsement of any opinions put forward in the paper. The date of reception of original papers by the council shall be considered the date of publication.

Rule XI.—Paragraph 23, "Election of Council and Office rs," was then read and discussed.

23. The mode of election of officers shall be by ballot of the entire members of the Society. The president, vice-presidents, treasurer, and all the members of council shall retire annually, but be eligible for re-election. That no member of council be eligible for re-election to office unless he shall have attended at least half the meetings of council. That no member's name shall be printed and circulated for election to serve on the council before the consent of such member is obtained, and that each nominator shall hand to the secretary the written consent of each nominee. Every member of the Society shall be at liberty to nominate one member as president, four members as vice-presidents, one member as treasurer, and twenty members as ordinary members of council; and, at least fourteen days before the last day for receiving nominations, a circular letter calling attention to this right of nominating shall be sent to each member at his registered address, and also containing a list of the retiring officers, and the number of their attendances at council meetings. The secretary shall inform by letter each nominee of the fact of his nomination, and "no reply" to the letter will be considered as acceptance of the nomination.

Captain S. M. Maycock understood by this rule and the effect of 2 the secretary would become a permanent officer, and asked if a secretary had ever been specially elected by the members.

The Chairman said the appointment was made by the council.

Captain Maycock objected to officers and council being ineligible for re-election on the ground that half the council meetings had not been attended. The system would rob the Society of valuable members if the rule was carried out. Temporary illness or foreign travel might easily reduce the number of attendances in one year, as now laid down for qualification.

W. M. **Ashman** had all along contended that the secretary should be elected by the members specially for his office, and was sorry this had not been carried. It appeared undesirable to him that the portion of paragraph 23 relating to attendances should remain; it would be very much better to make every officer ineligible for a year, at least, after continuous service of three years. He concluded by moving after "re-election," "That no officer or member of council be eligible for re-election to office for one year after three successive years' service" be inserted instead of "attendance at half the meetings, &c."

S. G. B. **Wollaston** seconded.

At the request of the Chairman, T. Sebastian Davis, and others, the motion was modified to exclude the president and treasurer from the operation of this clause, when a show of hands was taken, sixteen voting for, and fifteen against the motion. The Chairman declared the motion carried.

Capt. **Abney** was dissatisfied, and requested it to be put again, the voting to be by ballot.

This was acceded to, the President leaving the chair to personally distribute the balls among the members, and visitors were requested to retire. In the result, there was eighteen ayes, and nineteen noes. The motion was therefore upon the second voting declared lost.

Lyonel Clark objected to the stringency of half attendances; whether a member be ill or not, he might be unable to get in the required number of attendances, and could give a good account for absence.

T. **Samuels** thought illness to be a sufficient excuse for non-attendance.

Capt. **Maycock** then moved, and Capt. Abney seconded, that the words "That no member of council be eligible for re-election to office unless he shall have attended half the meetings of council" be expunged. For the motion thirteen, and against eleven. The motion was declared carried.

H. M. **Smith** and J. **Traill Taylor** moved the adjournment of the meeting; carried unanimously.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 15th inst., at Masons' Hall Tavern, Coleman Street, E.C., A. **Haddon** in the chair.

W. H **Harrison** read a paper entitled "Historical Notes on the Optical Lantern" (page 803). The earliest forms of the instrument and mode of illuminating were illustrated by sketches on the black-board, and at the end of the discourse Mr. Harrison suggested discussion on his paper be postponed to enable Messrs. Carpenter and Wesley to exhibit a few of the oldest and most choicely hand-painted slides they had been able to collect. This course was agreed to, and the discussion was adjourned until the last Thursday in January, which is one of the regular lantern meetings.

W. **England** wished to say that four or five years before the old Polytechnic Institution closed, he recommended Dallmeyer's portrait combination lenses to be used in the lanterns at that place, with the result that definition and brilliancy were greatly augmented.

J. T. **Taylor**, about twenty-five years ago, read the first paper on this subject before the Edinboro' Society, in which he advocated the use of achromatic lenses. The illumination was far superior to any he had seen at the Polytechnic. The addition of a third element mentioned by the lecturer that evening was thoroughly treated by a member of the Society in the new Almanac. He was sorry there was to be no discussion, as he saw Mr. Darker present, who knew as much about lanterns as any man living.

An exhibition, chiefly of hand-painted slides by celebrated artists, brought the proceedings to a close.

Camera Club.

On Thursday, December 15th, there was exhibited at the Camera Club, a large number of lantern slides, from which the 200 to be exchanged for a similar number with the American Photographic Societies will be selected. These slides have been contributed by members of the Club. Some of those shown were of great interest. Amongst the contributors to the collection are Messrs. Gale, Pringle, Wainwright, Howard, Dresser, Davison, Lucas, Howlett, Webber, Barclay, Linton, Mason, Stenning, Wild, Greene, Robertson, Ferrero, and Copland. The lantern worked by Messrs. Lyonel Clark and Ferrero, and a new self-centreing carrier brought by Mr. Hussey, was used. This carrier throws each slide into position, as required by the movement of a lever, and it is impossible for the slides to suffer damage by being thrust out of the carrier. The only objection to it would appear to be the rather noisy movement of throwing the slide into position.

Previous to the exhibition the **Hon. Secretary** again drew attention to Mr. Kellar's washing tank, which was now put in working order in the Club dark room; and he also drew attention to some very neat and convenient cases in the form of books for holding mounted photographs instead of albums. These had been left by Mr. Dresser for exhibition, and were said to be introduced by Messrs. Wolff.

Edinburgh Photographic Society.

The second ordinary meeting of the current session was held in the Professional Hall, 20, George Street, on December 7th, W. **Forgan** in the chair. One lady and nine gentlemen were elected ordinary members, and six gentlemen were nominated for election in January.

Dr. **Alex. Hunter** made some descriptive remarks upon places in the Highlands which he had recently visited, and where good subjects might be had for exposures when members were holidaying in the north. He gave a good idea of the spots he referred to by handing round a considerable number of large water colour sketches made by himself during the past summer.

This being the occasion when the annual exhibition of members' work takes place, a large and interesting collection of prints were arranged upon the walls. This year the exhibits were not so numerous as on some past occasions, but some very fine technical work was shown, while the picturesque was evidently well kept in view in many examples. Some very good cloud effects were shown, obtained by double printing, which seems to be almost essential where the best results are aimed at. Landscapes formed the bulk of the exhibits, and were well represented in forest, lake, and fell. Several members sent frames of figure studies which deservedly attracted much attention. They chiefly depicted fishing village scenes, occupations, and life. While there was no direct work of large size exhibited, save in one instance, a number of gelatino-bromide enlargements gave pleasing variety to the display. As usual, silver prints constituted the majority of what appeared, and of these the smaller sizes did not fail to hold their own. Not the least interesting and clever, because of the great difficulties encountered in securing them, were the marine subjects hung. In a creditable number of instances the pictures of shipping were admirable, the feeling of breeziness and wave motion being capitally caught. The collection was not confined to members residing in the city. but contributions came from those at a distance as well, even as far as the banks of the Rhine. The largest work shown was a presentation to the Society by Mr. W. Crooke, being a copy in platinum of the group taken on a 25 in. plate at Craigmillar Castle, during the late visit of the "Convention" party from Glasgow. It is a very welcome addition to the Society's properties, and will ever be interesting on account of its subject. The frame is the gift of Mr. Thomas Wardale. Mr. Graham, of Derby, presented twelve copies of a remarkable instantaneous picture of a flight of sea gulls, which will be ballotted for at a future meeting of the Society. A large number of portraits of past and present members were displayed, and the Society's new portrait album was laid open to view. The president invited the members to add to the collection it already contained by prints, if possible, executed in some of the permanent processes.

A number of cameras and dark slides were arranged upon the tables, and were the objects of much inspection during the evening. A. H. Baird exhibited a Brown's patent camera and dark slide. A feature in this slide is that it offers a means of taking two pictures upon one plate. When this is desired, a dark screen covers half of the space occupied by the focussing glass the slide is pushed half in, and the door half drawn out; after, which, the second exposure is made by pushing the slide fully home, and uncovering the other half of the plate. The sliding front in this camera carries the bellows with it when moved up or down. H. Auld showed a Gotz camera which contained several very good points. The power of adjustment of the focus so as to suit widely different lenses is very considerable, and a circular excentric front gives great latitude of movement. The slides are of the "solid" make, and beautifully designed. The tripod head seemed of a new pattern. E. Shawcross also described his camera, which possessed some useful arrangements in view of portability.

The President intimated the approach of the popular evening season, and urged members to prepare their transparencies in good time. The Council also were making arrangements for a public lecture in Queen Street Hall with lantern illustrations, which would be intimated in usual course. A distribution of prints at an approaching meeting was also intimated, and contributions of prints solicited for the same.

The attendance was very large.

Derby Photographic Society.

At the meeting in Sykes's rooms, Victoria Street, on Dec. 13th, R. Keene in the chair,

Frank Cooper read an able and instructive paper, entitled "Photographic Experiences," which elicited some discussion, Mr. Cooper answering a number of questions put to him on the subject.

The Chairman announced that the annual *conversazione* would be held on January 11th, 1888, in the Lecture Hall, when there would be an exhibition of photographs and lantern slides, also demonstrations of photographic printing processes, &c.

It was decided to inaugurate an annual supper, to be provided in the Society's meeting room, upon a date to be fixed during January.

The Hon. Sec. handed round to the members present some of Wolff's patent adhesive mounts sent by H. Senier.

North Staffordshire Amateur Photographic Association.

The monthly meeting was held on December 7, W. E. Leek occupying the chair.

It was decided that ladies should be admitted to membership of the Society without paying subscription; the annual subscription payable by gentlemen to remain five shillings.

It was resolved that all the business of the Society should be transacted by the council alone, and that under no circumstance should any business matter be introduced at the monthly meeting, which should in future be devoted entirely to matters photographic and interesting.

The prints entered in competition for the prize given by Mr. Drummond having been examined by the members, and voted for, a print by Mr. Leek was found to have obtained greatest number of votes.

The Chairman then offered a prize for artistic merit in a photograph; the competition to take place at the next meeting.

A member announced his intention of giving a demonstration of his method of using the limelight, for the purpose of showing upon the screen lantern, pictures developed by members at the meeting.

The proceedings closed after the election of Messrs. Beech, Stanway, Varcol, Lobly, and Dr. Cropper as members.

Photographers' Benevolent Association.

A committee meeting was held on the 15th inst., when the following were elected members of the association:—E. Darlington, A. R. Dresser, F. R. Greenslade, J. Hendrie, W. J. Humphrey, E. A. Rice, E. N. Smart, E. Simpson, and Misses Coslett, Hawker, Reddy, and Sisman.

Four urgent cases were considered and substantial assistance given.

W. J. Humphreys and H. J. White were elected members of the committee.

W. M. Ashman resigned the chairmanship of the committee owing to his business taking him from London, and W. Beford was unanimously elected to fill the vacancy.

The meeting then further considered the preliminary stages for the inauguration of the orphans' fund.

The Yorkshire College Photographic Club.

The meeting on December 13th was devoted to a discussion on "Methods of Enlarging," the President, C. H. Bothamley, occupying the chair.

A. E. Nichols described the apparatus which he employed for enlarging or reducing daylight. It consists of two stout wooden rails seven feet six inches long, fastened together by cross-pieces; on these rails slide three frames, one of which is fitted with a series of carriers for negatives of different sizes, the second carries the lens, and the third is an easel on which the paper or plate can be fixed. A series of flat boards about twelve inches long slides along the rails, and prevents the access of any light from below. Laths pass from the upper part of one sliding frame to the next, and a cloth is thrown over these to keep out the light. The frame carrying the negative is placed against a window and tilted at such an angle that unbroken sky illumination is obtained.

C. H. Bothamley described the usual method of daylight enlarging by means of an ordinary camera, the negative being placed in the camera, and fixed against a window, and illuminated by means of a reflector, whilst the enlarged image is produced by the ordinary objective fixed in its usual place in the camera front.

F. W. Branson exhibited and explained a complete form of apparatus for enlarging by means of the oxyhydrogen light. The condenser was nine inches in diameter, and the objective was a Ross 8 by 5 rapid symmetrical. The condenser was fixed, but the distances of the light and the object from it could be readily adjusted by a sliding motion. The illumination of the field was perfectly uniform as far as the eye could judge, and a half-plate negative enlarged six diameters was perfectly sharp to the corners with a stop $\frac{f}{11}$.

C. H. Bothamley briefly explained the optical principle involved in using a condenser, and insisted on the necessity of having the light, condenser, and objective always fixed, or of being able to adjust the distances of both the light and objective from the condenser. He pointed out that the ordinary lanterns for projection were not very suitable for enlarging purposes, on account of the small range of adjustment. He also exhibited and described an apparatus for enlarging with either an argand gas lamp or the oxyhydrogen light.

Dr. E. H. Jacob had obtained good results with an argand oil lamp used in an ordinary projection lantern, but had found it desirable to adopt some form of apparatus permitting of more ready adjustment. An efficient apparatus can be made out of very simple materials, involving little expense beyond the cost of the condenser, the camera lens being of course used as the objective. He considered that when working with paper it was possible to use a much greater quantity of yellow light than was commonly employed.

In reply to Mr. Whitham, the secretary (Harry B. Hall) had had experience in the making of enlarged paper negatives which could be used for printing by any process, and had obtained very satisfactory results.

Further discussion of a conversational character followed, in which the previous speakers, the Rev. W. Hancock, Mr. Whitham, H. Pocklington took part. There was a general consensus of opinion that if enlarging was done at all, it was not worth while to use anything bigger than a quarter-plate camera in the field that Eastman paper was uniformly good, and easy to work, and gave excellent results with suitable negatives; but that Morgan and Kidd's paper was more rapid, and gave a better rendering of half-tones when used with negatives which are good printing negatives for other processes; that when an enlarged negative is required, it is much better to make an enlarged transparency, and print the negative from that by contact, any retouching being done on the enlarged transparency or negative or both, and not on the original negative.

The annual lantern exhibition will take place on Jan. 27th, 1888, and the annual exhibition of pictures, &c., on Feb. 14th in connection with the *conversazione* of the Yorkshire College Students' Association.

Talk in the Studio.

Photographic Society of Great Britain. The usual Monthly Technical Meeting of this Society will take place on Tuesday next, December 27th, at the Gallery, 5a, Pall Mall East, at 8 p.m. Open at 7 p.m. for journals and conversation.

Photographic Club.—The next meeting, December 28th, will be a lantern meeting. Visitors invited. Discussion on "Lantern Matters."

Partnership Dissolved.—Under this heading last Friday's *Gazette* contains the following:—"Alexander Lamont Henderson and William Middleton Ashman, 3, Amersham Road, New Cross, Kent, photographers, dissolved by mutual consent. The business will henceforth be carried on by the said Alexander Lamont Henderson alone." We are informed that W. M. Ashman and H. M. Smith will carry on a provincial business as Smith and Ashman.

The Jennings Fund.—Andrew Pringle, of Cromwell House, Bexley Heath, S.E., writes :—"Will you kindly in next News acknowledge: The Liverpool Amateur and Birkenhead Photographic Societies, collected at a dinner, per G. H. Rutter, Esq., President L. A. P. A., £3 6s. 6d. Also, Messrs. Jas. Swift and Sons, £1 1s. The latter firm has further consented to put into thorough working order Mr. Jenning's 'Challenge C. Binocular,' which is for sale with 1 inch and $\frac{1}{6}$ There are for sale also a number of objectives, 5", 3", 2", 1½", $\frac{2}{3}$, $\frac{2}{3}$ higher angle, $\frac{1}{5}$, and a polariscope. Also a lot of mounted objects, many being minerals. Offers may be made to me. Seen at Swift's 81, Tottenham Court Road, W."

Decoudun's Photometer and the Stereoscopic Company.—Chas. Reynolds and Co., of Milk Street, Cheapside, write :—"Our attention has been called to a letter from Messrs. Marion and Co., in your issue of the 16th inst., and in fairness to ourselves and to the Stereoscopic Company, who make their statements upon facts given them by us, we must explain that we are the sole licensees of Decoudun's Photometers since September 23rd, so far as England is concerned, having a legally signed agreement between Decoudun and our representative in Paris, to this effect, upon consideration of our taking a certain large quantity. This being the case we offered the sale of this article to the London Stereoscopic Company for London, and to other important houses in the country on the condition of their likewise taking from us considerable quantities to retain in their hands the exclusive sale in their districts. Decoudun has further undertaken that he will not sell to any other house shipping to England, and if he finds that any sold by him to commission houses are sent to England he will discontinue supplying such houses." In relation to this matter, the Stereoscopic Company write :—"Sir,—We regret to notice your remarks in your editorial of the 16th inst., anent the 'Perfect Photometer,' as they were evidently penned under a misconception. We immediately called upon M. Decoudun's licencees, who had guaranteed us the exclusive sale for London, asking them to explain how any other London firm could have procured any, and were informed that so far up to this date no firm, other than ourselves, have been supplied, and that if any were in this country, they must have been purchased in Paris and shipped over here either previous to September last, or in contravention of express arrangement made with M. Decoudun. Having secured the sole licence for London, we feel sure you will admit our right to follow the usual custom of the trade as advertising it as ours, although possibly it has escaped your notice that we give the patentee due credit by stamping his name on the photometer ; therefore any question as to our right raised by rival firms merely displays the petty jealousy incidental to business."

Camera Club Special Lessons in Photography.—An elementary course of lectures and demonstrations for members will be commenced on Friday, January 13th, 1888, at 8 p.m., and members are notified that there will be no charge whatever for either the course, or for the special lessons. The lessons and demonstrations will cover general photographic work, also platinotype printing ; carbon printing ; lantern slides, wet collodion ; lantern slides, gelatine dry plates ; micro-photography ; ortho-chromatic photography ; art in photography ; elementary photographic chemistry ; and retouching. Gentlemen who are not already members of the Club, and who desire to take advantage of the course of lessons announced herein, should communicate at once with the Hon. Secs., 21, Bedford Street, Strand, W.C., as to taking up membership.

To Correspondents.

*** Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, Photographic News, 5, Furnival Street, London, E.C. ;" while Advertisements and Business letters should be forwarded to "Piper and Carter, Photographic News, 5, Furnival Street, London, E.C."

*** We cannot undertake to return rejected communications.

Chas. Knight.—Thank you for the additional specimens, which, like those previously sent, are extremely interesting and satisfactory.

C. R. S.—Unless we know something of the history of the print, we can only vaguely conjecture. Possibly it may be due to hypo remaining.

T. B.—1. Add a little common salt to the first washing water. 2. Three, or three and a-half times as much. 3. An extra rapid rectilinear. 4. Yes, if provided with a good objective. 5. Abney's "Instruction in Photography." 6. No.

H. Pickering.—We are interested in knowing that you have been making such an emulsion for sale, but there is nothing whatever on your printed notice to indicate that it is a preparation of gelatino-chloride. Perhaps you will send us some particulars as to your experience, and if you send the sample we will forward it to W. M. Ashman.

Chapman Jones.—Thanks—to hand.

William Jones.—The negative is well washed, and immersed in the following :—

Nitrate of lead	4 parts
Red prussiate of potash (ferricyanide) ...	6 ,,
Distilled water	100 ,,

Often one minute is enough, but when the collodion has been dried and the film is very hard, some hours may be required ; at any rate, the plate should remain in the bath till no further change is noticeable. Next wash thoroughly and immerse in the following, allowing sufficient time for the film to become blackened throughout its white thickness :—

Commercial liquid sulphide of ammonium ...	1 part
Distilled water	5 parts

Full particulars as to the process will be found in a series of articles which commenced on page 100 of our volume for 1876.

Solar Radiance.—Thanks for the information, of which we may make use before long.

C. Moody.—We will go over the matter in connection with the index, and if there has been a mistake, it shall be corrected.

R. Laidlaw.—The book is, we believe, out of print, but it was originally published by the Society of Arts. We have returned your enclosure.

E. S. Everleigh.—Any engineer who has a good planing machine can make the ruled plate for you, and the fine wire can be obtained from any miller's material furnisher. The book is not yet published.

W. Williams.—Yes, in reply to both questions.

A. Cooper.—We are very pleased to receive the excellent flash-light photograph you send, and we shall be very pleased to have an account of your igniting arrangement ; also illustration of the same.

W. McDonald Stuart.—Tone and fix as in case of prints on albumenized paper. See 1887 Year-Book, page 201 ; also 1888 Year-Book.

G. and W. Morgan.—To the mixture, add chloride of calcium (not the so-called chloride of lime, or bleaching powder) in quantity equal to about one-third of the gelatine employed. Other favourable conditions are, a thick film, and drying at a high temperature. Write again if you fail. We have used Nelson's "Amber" gelatine with success for the kind of work you desire to do.

P. Swanson.—Please send us the notes for publication.

The Photographic News.

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THE PHOTOGRAPHIC NEWS.

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DIFFERENCES OF OPINION.

There is, perhaps, nothing that has given rise to more differences of opinion than the practice and theories of photography, and it is scarcely possible to make the simplest statement in connection with a photographic process or result with a full conviction that no one will take exception to it, and we do not call to mind any of the great improvements, whether artistic or scientific, that have not been pronounced impossible or undesirable. Although this state of affairs indicates a lively interest and a vigour of thought that cannot but be commended, it also shows a general lack of solid fundamental knowledge, or an inattention to recognized scientific methods.

It is practically impossible to contradict a simple statement, such as is often made to convey the information of a successful innovation. If, for instance, it is announced that the addition of a certain substance to an emulsion confers a certain property, the statement is not of necessity falsified if a hundred photographers try the experiment of making such an addition, and they, without exception, fail to get the described result. If, indeed, they all get an opposite effect, their experiments do not disprove the original statement, because it is quite possible that some essential condition has not been complied with. A proof of the error of such a statement can only be approached by making experiments with all possible proportions of every modification of the added substance, and the making of such a series of experiments with all possible modifications of emulsions. Although this is a scientific method of meeting such a statement, it would not be advisable in the majority of cases, because the statement would not, perhaps, be worth the expenditure of so much time upon it.

There is another method which is just as reasonable, and almost invariably to be preferred, and that is not to attack the concise announcement at all, but to ask for full experimental data of the work that has led to the result claimed. It is then possible to form some estimate of the value and scope of the matter, and to repeat the experiments, extending them if necessary, or simply to give an opinion that the generalization has not been experimentally justified.

The unpleasant results of hasty attempts to pronounce upon the value of unqualified statements have been manifested over and over again in connection with the preparation of orthochromatic plates. Dr. Vogel's first announcement of the effects of dye as sensitisers, was considered incorrect by some of the principal photographic experimentalists of the day, because they failed to get results corresponding to his. It appeared afterwards that they failed chiefly because they employed too much colouring matter. And it has not unfrequently happened since then, that contradictory results have been obtained by different workers because the material used has not been the same, although the names under which the samples have been sold were identical.

It requires a considerable amount of training, besides a natural aptitude in the scientist, to gain the ability to get a complete view of any phenomenon, and a photographer who has not these qualifications would find it safer to clearly describe his experiments with the results he considers he has obtained, than to attempt any broad statement of the effect of this or that process or reagent.

It is, perhaps, at the conversational meetings, such as those of the London and Provincial Photographic Society, or the technical meetings of the Photographic Society of Great Britain, that differences of opinion are least mischievous in their tendency—or, at any rate, least likely to cause a permanently erroneous impression on the minds of persons—for here it is generally easy to lead the conversation towards those side issues where the key to the differences is to be found, and a good illustration of this is to be found in a conversation which took place at a recent meeting.

The old question as to the relative rapidity of a doublet and a single lens was raised, and the discussion waxed warm on the matter for ten minutes or so, such matters as the extra thickness of glass, the opalescence of the same, and the number of reflecting surfaces being brought under review. All this time everyone assumed that the champion for a considerable extra rapidity of the double combination was speaking of instruments of identical aperture and focus, or, at any rate, having the same ratio between stop and equivalent focus; but on enquiry it was found that this was not the case; a single lens sold for covering the same plate had been taken, and the difference in focus was considerable, while similar stops had been used. One side had been taking a purely photographer's view of the case, and the other had been taking an optician's view, while neither side had a care to clearly define at the outset the fundamental conditions to which his remarks were subject.

Probably our readers would be much advantaged if more of the conversational element were introduced into our columns, a thing which can only happen by our readers taking the matter into their own hands, and more frequently discussing in the correspondence columns such matters as may appear obscure. We may remark that every letter intended for publication should be signed with the real name of the writer, but correspondents who merely desire to be answered editorially on the last page of the News may write to us over any assumed name or initial. In all matters respecting which there may be reasonable scope for differences of opinion the advantages of open discussion should be obvious to all, and in such cases the open column can well be made use of, while regarding matters of common knowledge an editorial answer may suffice.

HYDE PHOTOGRAPHIC SOCIETY.

The second exhibition of photographs will be opened on January 5th, by J. W. Sidebottom, M.P., and the show will remain open till the afternoon of the 7th. The committee will be glad of contributions of exhibits, and they say that the greatest care will be taken of all photographs, and carriage will be paid both ways on exhibits of photographs (framed or unframed). No charge will be made for wall space, and exhibitors will be allowed to fix a price upon their pictures, but a commission of 20 per cent. will be charged on all pictures sold by the Society. Exhibits to be sent to Photographic Society, Mechanics' Institution, Hyde, care of John Chorton, not later than December 28th, 1887. Communications to John Pennington, Hon. Sec., Great Norbury Street, Hyde.

LECTURES ON PHOTOGRAPHY AT THE BIRKBECK INSTITUTION.

BY CHAPMAN JONES.

Chapter XVI.—Rapidity of Lenses—Depth of Definition—Effects of Point of View—Effects of Angle of View Included.

The rapidity of lenses is always comparative, and depends entirely upon the intensity of the light transmitted by the lens to the surface that receives the light, and the extent of surface that this light is spread over. The following are the chief items, which, as they increase, diminish the intensity of the light, and therefore the rapidity of the lens. The thickness of glass, the colour of the glass, the number of surfaces of glass, as each surface in contact with the air causes loss of light by regular reflection as well as by reason of the irregularities of its surface, and the distance that the sensitive surface is from the lens. Increase in the aperture of the lens gives an increase of rapidity.

It is only the last two of these controlling circumstances that can be estimated with certainty, and as these two items are by very far the most important, it is usual to have regard to only these in stating the rapidity of a lens. It should be distinctly understood that rapidity is not influenced by focal length directly, and that focal length has nothing to do with rapidity except that under certain circumstances it decides the distance of the sensitive surface from the lens. Speaking practically, we may say that in copying, and in portraiture, the sensitive surface is never placed at the principal focus of the lens, and in these cases, therefore, the focal length has nothing to do with the rapidity.

Other things being equal, rapidity is inversely proportional to the square of the distance of the sensitive plate from the lens; and if the distance between the lens and the object is unchanged, this statement may be varied by saying that the rapidity is inversely proportional to the area of the image, or to the square of its linear dimensions.

In comparing the rapidities of various lenses without reference to any special work, it must be assumed that the surface that receives the image is so placed that the principal focus of the lens is situated upon it. Hence we have the statement that the rapidities of lenses vary inversely as the squares of their focal lengths, a statement true enough in the abstract, but true practically only when the sensitive surface is situated as above.

The rapidity of a lens—that is, the amount of light which it transmits—is directly proportional to the size or area of the lens, or of the diaphragm, when that is smaller than the lens. As there is no simple way of measuring the areas included by circles, and as such areas are proportional to the squares of their diameters, the square of the diameter is a more useful comparative expression than the area. The actual aperture of a lens is greater than the opening of the diaphragm when this is behind a lens, as in portrait combinations and doublets in general, because the lens condenses the light; but the actual size of the opening in the diaphragm is quite near enough for practical questions connected with exposure, because the loss of light by reflection from the extra surfaces when two combinations are employed instead of one, probably more than compensates for the slight gain by the condensing effect of the front component.

It is convenient to combine these two chief items; that is, the distance of the sensitive surface from the lens (assuming this to be the focal length of the lens), and the aperture of the lens, to get a single figure that shall express the proportional exposure required. Other things being equal, the exposure must be directly proportional to the square of the focal length, and inversely proportional to the square of the diameter of the aperture; and therefore by dividing the first figure by the second, we get the single figure desired. It is more convenient, however, to avoid the two squares, and the use of such high figures as these would result in, by dividing the focal length by the aperture, and squaring the result.

What is called, in common language, "depth of definition," is practically necessary, though in an absolute and optical sense it is an impossibility. In all photography except copying from flat surfaces, it is necessary to delineate objects that are at different distances from the lens, and objects which therefore cannot be all in focus simultaneously. In portraiture the ear and the hair must be represented as well as the nose, and in landscape work the foreground and the distance are generally taken at the same time on the same plate. To gain these ends something must be sacrificed.

In discussing this matter it is necessary to leave altogether the optical definition of focal points, and to determine the maximum amount of out-of-focus effect that shall be accepted. The usual standard allows that what should be a point may be a spot the one-hundredth of an inch in diameter, and therefore that what ought to be a line (that is, length without breadth) may be a gradual shading or vignetting one-hundredth of an inch in width. This standard, however, is only arbitrary, but it is useful, because tables have been calculated showing the actual amount of depth of definition under varying circumstances without exceeding this amount of diffusion of focus. Depth of definition varies inversely as the diameter of the aperture, so that given proportional increase in depth of definition gained by reducing the aperture, requires an increase in exposure corresponding to the square of the gain in depth. For example, by halving the aperture diameter the depth of focus is doubled, but the exposure must be four times as great as before. Depth of definition also varies inversely as the square of the focal length for the same rapidity.

Ease of focussing, other things being equal, depends upon depth of definition, hence the great advantage in using lenses of short focal length in the matter of focussing, and the reason why beginners should always practise at first with small plates, and the lenses suitable for them.

This naturally leads us to the consideration of the effects of the focal lengths of lenses upon the picture produced. We hear much of the advantages of long focus for ordinary use, and of the utility of short focus lenses in confined situations, of the "false perspective" given by short focus lenses, and so on. These results are, one and all, due not to the focal length of the lens, but to the point of view selected, and that is, the position of the lens with regard to the object. Every lens in the same position will give the same picture to the extent that the lens is able to define, and the focal length of the lens will influence nothing but the proportional size of the representation of the object. But when the photographer has only one lens, and determines to make the picture cover the plate used, he wanders to and fro with his camera until this condition is fulfilled, and then makes the focal length of the lens the excuse for many shortcomings. The point of view ought to be selected without any reference to the lens, then, if the picture desired more than covers the plate, it is impossible to secure the subject without a lens of shorter focal length, which will give the picture on a smaller scale. But if the desired view as reproduced is anything smaller than the plate, it may obviously be secured. Uniformity of size in pictures is impossible without a large assortment of lenses, unless the operator aims at producing mere photographs rather than pictures; but by varying the size of the pictures as occasion requires, one lens is sufficient.

If the point of view, the amount of subject to be included, and the size of the picture are determined, there is only one focal length of lens that will give the required picture. As defects in these matters are commonly referred to the lens, though they are only associated with it and not dependent upon it, it will be convenient here to refer briefly to the nature of the most important drawbacks to certain undesirable procedures in determining the point of view, the angle of view, and the position of the lens.

The perspective of a picture as produced by any ordinary lens is absolutely correct, and will always appear to be correct when viewed from a point having the same relation to the picture that the lens had during the exposure; but the picture will never be true to nature when looked at from any other point. The same limitation extends to pictures of every sort that represent solid objects. The skilful hanging of pictures makes it at least possible for the spectator to see them as they ought to be seen—though even this is not possible in ordinary galleries. Bearing these facts in mind, the operator will often be able to decide at once the best course where he has two or more ways open to him.

Every one looks at a picture as nearly centrally as possible, unless there is some special object that draws his attention always to it, in which case that object will probably be placed opposite the eye; therefore, the lens should be opposite the centre of the plate, unless there is a point of interest so strongly marked that it causes the attention to be concentrated upon it, when the lens may with advantage perhaps be brought opposite, or nearly opposite the centre of interest. A picture under examination is not conveniently brought nearer to the eye than a distance equal to its greater dimension, and is more often viewed from a greater distance. Therefore, the shortest focal length of lens used should be equal to the greater dimensions of the plate, except only in those cases where a subject must be taken that it is impossible to secure without using a lens of shorter focal length. There is no fear of using a lens of too long a focal length.

By changing the point of view new features are often brought into sight, as in the very simple case of a building with a sloping roof. The operator at *a*, in fig. 40, will get no indication of the roof in his picture, but by retiring to *b* he will get this desirable addition. His picture at *b* will be on a smaller scale unless he uses a lens of longer focal length. The distance that the camera is from a model in portraiture is an exceedingly important item in securing a pleasing likeness. In fig. 41 there are two vertical lines joined by a horizontal line, the simplest expression of the contour of a sitting figure. The near point of view (*a*) causes the horizontal line, or lap of the model, to cover a very much larger space in the picture than when the point of view is shifted to a more suitable distance (*b*). The same proportions can be got by lowering the near point of view, but this would entirely alter the appearance of the face, showing the underside of the nose, &c. Anything round—such as a ball, a column, a face, or a limb—shows a greater extent of surface from a distant, than from a near, point of view, as show in fig. 42. Such objects have, therefore, an appearance increasing in fullness and richness as we retire from them until other matters interfere (loss of visible detail from smallness of image produced, loss of detail from mist in the air, &c.).

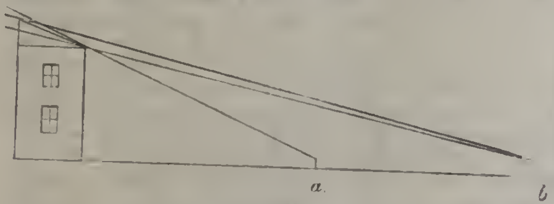

Figure 40.

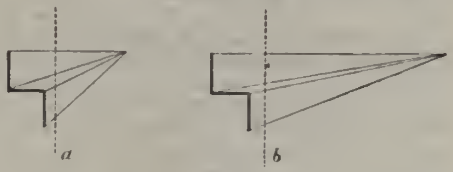

Figure 41.

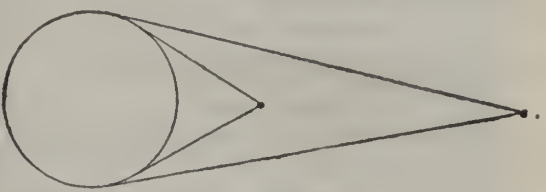

Figure 42.

There is a distortion always present when an image is produced by a lens or a pin-hole upon a flat surface, because the surface is flat. Considering the picture as bounded by a circle, this distortion is an abnormal increase in size in the direction of radii of the circle, and the distortion increases rapidly as the distance from the centre becomes greater. This distortion is more marked, therefore, when a wide angle is included. A colonnade or an avenue of trees of equal girth will be represented as if those whose images are produced on the edge of the plate were stouter than those in its centre. Fig. 43 shows this effect, and at once makes clear the reason of it. If a statue is reproduced at the edge of the plate it will appear stouter in proportion to its height than it is really. If the eye is brought to exactly the right position in viewing a picture so produced, these discrepancies disappear, and, indeed, are necessary to properly represent the object; therefore this distortion is only an evil when it is so exaggerated that it is practically impossible to see the picture from the proper point, or when the effect is detectable as a fault to the trained eye. This effect may be eliminated by means of a plate of glass with parallel sides, put between the lens and sensitive plate, and it is increased by putting such a plate of glass between lens and object; but these are refinements that we have not space to do more than mention. They are worth regard, however, by those who use glass screens in orthochromatic photography.

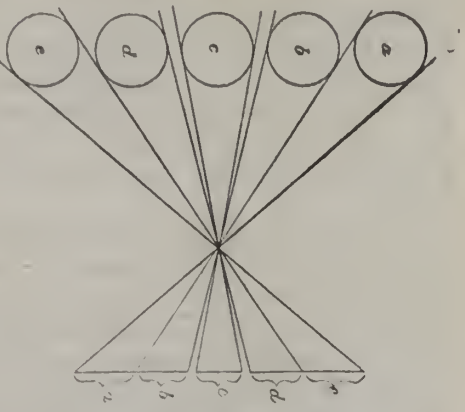

Fig. 43.

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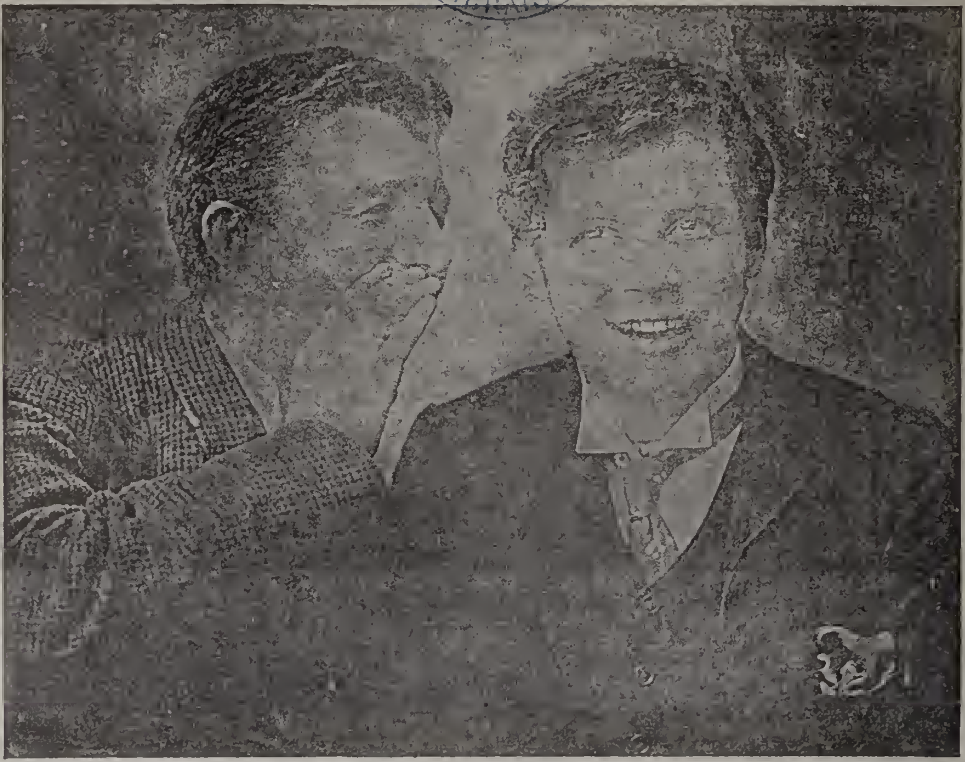
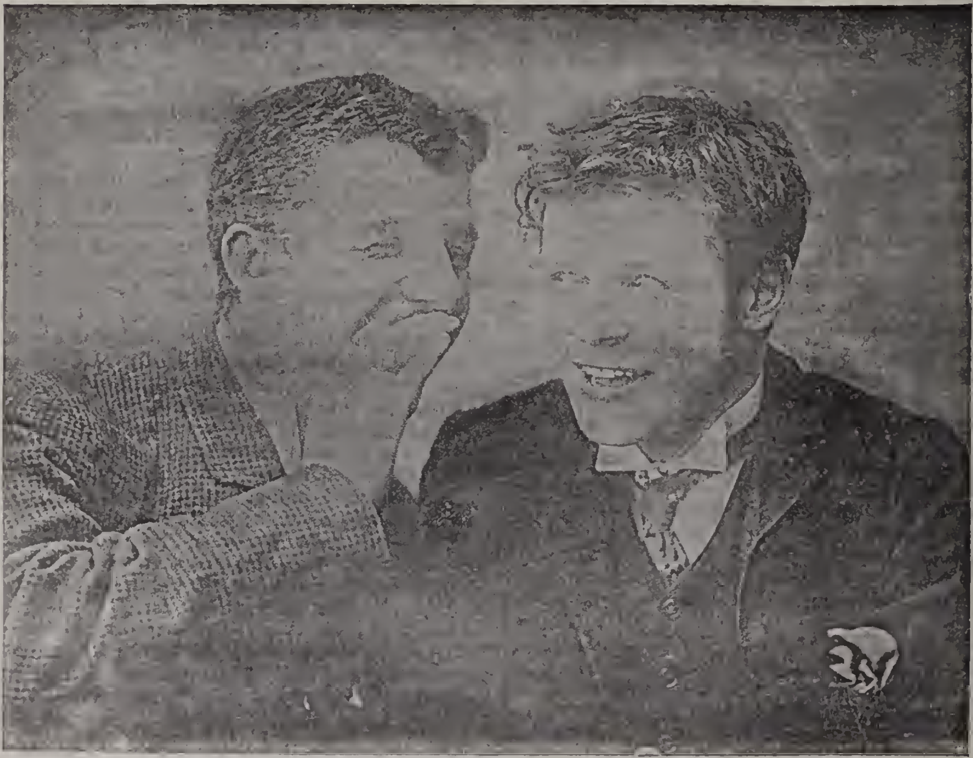
TELLING A STORY. By T. Illingworth, of Halifax. [*These Illustrations are Copyright.*



THE STORY.



"OH! IT'S A GOOD 'UN."

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"NOW, DRAW IT MILD."

IN NORTHERN LATITUDES WITH A CAMERA.

BY LEWIS MEDLAND.*

In my return journey to St. Petersburg I took one out of the train window, of a station, the usual pile of wood, mosque, &c. After visiting many places of interest such as the Hermitage, Royal Stables, the place where the late Czar was killed, Peter the Great's hut, also his palace, the Church of St. Peter and St. Paul, where service was being held with the usual crossings, bowings, scrapings, genuflexions, and rapping of foreheads on the floor. I narrowly escaped treading on the skull of one of these Icon or picture worshippers. As it was I gave him a nasty knock on the side of the head. Well, it was his fault—the ground is not the proper place for one's head. Underneath this church is a sort of Bastille, to which only single and no return tickets are issued. Having looked over the principal buildings and churches in St. Petersburg, I called at the English Embassy. They gave me very little hope of camera work here, and having heard that General Gresser—who, I believe, is as mighty as the Czar himself—perhaps would not be in an amiable mood, I discreetly left well alone, and thought if I asked permission and were refused I should then be watched; but if I did not ask, and an opportunity occurred, I could make the most of it.

The Czar's birthday afforded that chance, and, having gained permission of the hotel proprietor to photograph from one of the bedrooms, I soon took up position. Having taken that magnificent street Nevski Prospekt, the Regent Street of the city, I saw the procession of priests, &c., coming, attended by an immense crowd. I took several views of this, including one wherein a noted shrine was situated. Another view of the street, wherein the hotel was situated, completed my views in Russia. I won't tell you the name of that street; it is far too long, and requires a sore throat to be able to do it full justice. Russian words look like algebra and Euclid suddenly gone mad, and the man who painted them evidently stood on his head. It is said three sneezes and whiskey at the end is a good interpretation of the Russian language; it would not be complete unless a "cough" came in somewhere. The fête on the Champ de Mars was a sight not to be easily forgotten. Thousands upon thousands of all conditions of men and women were collected together into an almost solid mass, filling up all available space not occupied by fruit and other stalls, theatres, huge barrels of beer, swing boats, and numerous other amusements. Women dressed in many colours, some in stripes, others in plain red, blue, green, or yellow. The men wore high jack-boots, the usual form of cap and garment, for the red petticoat arrangement does not hide the shirt—for the reason they don't wear one. As to Nihilism, I shall say nothing, only that I am not surprised at it. Alexandrovitch had his chance, and he has let that chance go, so in all probability he will have to pay the penalty. N.B.—Russian censors do not forget to cut out, deface, or otherwise obliterate these sentences.

Returning to Cronstadt, from whence even the glittering dome of St. Isaacs can be seen on a fine day, we once more trod the *Ceylon's* deck, and great was the relief of all at leaving Russian soil. A heavy strain seemed to be upon us all the time; we were marks of suspicion, and we felt that all our movements were watched—for I consider that at least seven out of every ten persons are in Government employ in some form or other. St. Petersburg is a magnificent city, with grand and imposing buildings of modern architecture; Moscow, on the contrary, is a city of churches, towers, minarets, and shrines, the style of architecture being unique. It is said that when St. Basil was finished the then reigning emperor asked the architect if he could make another like it. On his replying in the affirmative his eyes were put out or his head chopped off—I don't know which—settling that little matter as to the duplicate in a very summary manner. Having had a look at Cronstadt, and having purchased some "real Siberian seal" goods (from off the backs of a musquash) at London house, we finally left this impregnable island on September 12th. I had been busily engaged with my camera through our extensive port-holes on the Cronstadt harbour, &c., while the custom-house officers were walking overhead and having a final look at our passports. As we steamed slowly away, many shots were taken at the forts, ironclads, &c., and which some day or other may become useful. A quiet journey through the Baltic and the Fjiord of Stock holm was reached on the 14th. A pretty scene, midst hundreds of rock-bound islands, some barren and others covered with trees, but how they find soil to grow on I know not. Arriving there a little before noon, we seemed in a little inland lake, surrounded by houses, bridges, buildings, and the like, while scores of gondolas passed us in all directions, reminding one much of black beetles scuttling away from an approaching light. Having had a look around, we next day took our cameras, and, first of all, went to the top of the Elevator, which enables persons for a small fee (5 öre) to easily reach the more lofty parts of the city. From this elevator we took panoramic views of Stockholm, commencing on the left and following it right round until nearly facing the sun. Down again (costing 3 öre), the floating market stage was taken (this in itself was quite a study); then to the flower and fruit market, where I secured two apple women quarrelling over some fancied grievance. Then a series of steamboats and gondolas, which form one of the means of communication between the various islands on which Stockholm is situated. Another plate went to perpetuate the Norrbro Bridge, the Gustavus Adolphus statue, and the Hotel Rydburg in the distance. Next, a view towards Lake Mälaren from the Palace terrace. Going below, a side view of the Palace itself, plain building as it is, was secured. A floating laundry next took my fancy. Giving up any more camera work for the day, we visited the Hasselbacken, Tivoli, and Mosebacke, which are of the usual continental style of cafés chantants. Next day I first exposed on one of the numerous long and narrow streets, a house covered with the usual style of advertising, and some boats of firewood being unloaded; after this, a scene on one of the several narrow streams, bridges over which connect the various parts of the Northern Venice. A very pretty island beer-garden and the busy life on the quay completed my morning's work. Returning to the ship to change plates, I crossed over a bridge whereon are two gilded crowns, and came upon a selection of Swedish children returning from school. I was about focussing the fort near at hand when the children grouped themselves on a large rock close by. I did not lose this chance, but secured their portraits, a few öre amply compensating them for their trouble. Having taken the *Ceylon's* steam launch, nearly opposite the Grand Hotel, where so many lives were lost some two years ago, when a concert was given in honour of Madame Christine Nillson, who is, I believe, a native of Sweden. From the island of Skeppsholmen, a pretty slide can be made of the very elevated tower on Kastelholmen. A bridge connecting these two islands formed my next subject, several boats and gondolas being moored close by. Returning, I came to a monument of rough granite to Professor Nordenskjöld, in commemoration of his Polar expedition; this, with some views from the Island of Djurgarden, much resorted to for pretty drives, finished the day's work. Next day, having taken a panoramic view from my port-hole, I got the Elevator and Fishmarket in one picture. Three peasant girls passed in their picturesque costume. I had completed all arrangements, when they moved on, so I followed them down a street, and, luckily, they met some young men, and planting the tripod down I took them without focussing, having carried it, with even the plate ready, from where they moved on. Several more market scenes, some of which suffered from a vibrating bridge, completed my Stockholm series. I found the people, as in Denmark, very kind and obliging, and I had no difficulty but curiosity to contend with. Patience and apparent indifference, and occasionally turning the lens in exactly the opposite direction, seemed to work well. Of course I have left nearly everything out that is not photographic, or I could say much about Stockholm; and I recommend those who next year contemplate a trip to give that city a trial, and if they don't thank me afterwards for telling them about such a charming place I shall be very much disappointed. I should say a little earlier than September would be better. They will find hotel charges reasonable, and the people honest, and not inclined to "try it on" with strangers.

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* Continued from page 779.

Leaving Stockholm on September 17th another smooth journey brought us off Elsinore early on the 19th, where I saw, from my porthole, the Castle of Kronberg, on the battlements of which is laid the ghost scene of Hamlet. I did not photograph the ghost. When outside the Sound the sea became lumpy, and the *Ceylon* thought it was about time to roll, and this she did right merrily. As usual in such cases, a few did not feel hungry, or had forgotten their pocket handkerchief. We rolled into the Fjiord of Christiania early on the 20th. The scenery here is on a much grander scale. There are not many islands, but the mainland is higher, with similar rocks and trees. Reaching a village called Drobak, we took on a pilot, and I took the village. A snap shot at two passing islands and we anchored in smooth water off Christiania at noon. Our stay was to be short, so we took our cameras ashore, and having found the Victoria Hotel, which seemed deserted, we at last discovered a short-sighted waiter, and tried to make him understand we wanted something to eat. By dint of perseverance and phrase book, which is a very useful companion, we had our wants supplied. Our first view was of a rural kind, the River Akerselv in the foreground, oats being dried on the poles, as is the custom here, and a hill with a church on the top in the distance. A series of shots at some cascades, carefully avoiding the semblance of civilisation in the form of mills and manufactories which surrounded them, came next; some old houses, Fort Akershus, and the day's work was over. Passing over our visit to the Viking ship, public buildings, &c., I next day went by myself and first secured that plain and peaceful palace of the King. A quarter plate was tried on the statue of Charles XIV., the adjoining gardens, and afterwards the principal church with a very long name. Down to the Stortorv, where I expended an hour before I could expose two plates on the market scene, as that "out of focus" style seems to be engrafted on the younger branches of the Norwegians as well as elsewhere. These secured, some more old houses pleased me, after which the cascades were again visited, as I was doubtful as to a couple of my previous exposures, for, by my note-book, I found I had more pictures than plates. A bridge with the Akerselv below, and a small group of fair-haired Norwegian children. Next day early I went by boat to Oscar's Hall. With me was an Australian globe-trotter, whose presence on board the *Ceylon* caused us much entertainment. Oscar's Hall in a bad light was taken, and one also of its tower and wooded surroundings. Back to the ship, and borrowing a couple of halves from my friend I secured my last panoramic views of Christiania from the stern. I therefore had exposed my last plate, and no more was to be done. I took only just enough for the trip. Hundreds could have been exposed at Moscow, half as many at St. Petersburg, but, as you are aware, I was not allowed. There is very little at Christiania, especially after the other places we visited. I exposed about ten dozen halves, and one dozen quarters. They were "Ilford Rapids;" my lens a Ross's Rapid Symmetrical; and the majority of my exposures were made with Newman's shutter, at a speed of $\frac{1}{4}$ to $\frac{1}{16}$ of a second with $\frac{f}{11 \cdot 3}$ and $\frac{f}{16}$. The reason why most of mine were quick exposures was on account of the people in their daily avocations being in nearly every picture. The light of course varied, and was very deceptive, and in Russia not so powerful as I was led to suppose. After an exceedingly rolling time of it we came to a stop off Gravesend on Saturday, September 24th, at 7 p.m. The Custom House officers coming on board I was cleared and got safely to Fenchurch Street, and on seeking my luggage missed a portmanteau. Glancing round I caught sight of a red oval label which I remembered was pasted on mine at Moscow. The porter said "a gent" had told him to take it down to a cab. Needless to say that gent did not show up, but made tracks on being found out. By a mere chance I saved some four dozen negatives.

A word on packing plates after exposure will not be out of place. Being "Ilfords," they were in the ordinary cardboard box. Placing them face to face until I had a solid block of fourteen, I fastened them together tightly with strips of gummed paper; wrapping them up in a piece of paper, I placed each block in a box. By this means almost any amount of pressure could be put upon them, which is not the case with grooved boxes, convenient as they are for temporary use. I have not found a plate broken, scratched, or spoiled by sea air. Were I to go a similar trip again I should take a half-plate camera, and, above all, a small quarter-plate unobtrusive "Detective." One of the latter would have been invaluable to me. The one belonging to my friend was much too large, and besides gave poor definition except in the centre of the plate, which was remarkably good.

To conclude, the following hotels can be recommended, viz., the Hotel d'Angleterre, Copenhagen; the Hotel de France, St. Petersburg; Hotel Berlin, Moscow; the Grand or Rydberg at Stockholm, and the Grand, at Christiania.

I cannot close my remarks without thanking the owner of the *Ceylon*, M. Drury-Lavin, Esq., M.D., for the information he afforded me; Captain Peters, his manager, for kindly arranging for the dark room; and lastly, Mr. Leon Warnerke, whose translations afforded me chances of securing several scenes in Russia which otherwise I should not have been able to obtain.

NOTES ON THE ART GALLERIES.

BY WIDE ANGLE.

The Institute of Painters in Water Colours.

Of the 758 pictures on the walls of the Institute, 114, or over one-seventh, are by lady artists. Of the sixty pictures which have been deemed sufficiently important to find a place in the illustrated catalogue, four only are by ladies. Most of these 114 pictures exhibit painstaking work; but, as a whole, they are uninteresting. If to this be added the fact that most of the better-known painters have gone in for smaller canvases—possibly with an eye to the depressed state of art and the limited pockets of the art patrons—it is not to be wondered at that the general effect of the Institute is one of mediocrity. Oil paintings are greatly dependent upon size, unless the painter be a Meissonier, and Meissoniers, it is unnecessary to say, do not abound.

In the west gallery, among the best pictures, are the "Just Too Late" of G. G. Kilburne, junr.—a new illustration of a somewhat hackneyed subject; Henry Moore's "Early Morning off Penzance," apparently a small replica of his picture in the Grosvenor last year; L. Raven Hill's "In Arcadia," a cleverly painted group of society idlers going in for rusticity; J. Clayton Adams' "Morning," in which the effect of the early light has been admirably caught; and "The Hammond Ponds, Godalming, Surrey," by Claude Hayes—a faithfully rendered landscape.

C. Brockman has two interesting pictures which deserve to be better hung than they are. F. Dadd is not so happy as usual in "Your little bill, sir." It is carefully painted, but the subject is trivial. Frank Walton's "The hill top hearsed with pines," is remarkably like a good many of other "pine" pictures of which this artist is so fond. Indeed, the tendency of most exhibitors at the Institute is to fall into grooves. Thus from J. C. Dollman one may always expect a picture with a comic goose in it; from W. P. Frith, Dr. Johnson doing something or the other—in 285 Mr. Frith has trotted him out neat, tidy, spick and span, as the slovenly old doctor ever is in Mr. Frith's eyes, doing the gallant to Mrs. Siddons; from Edwin Hayes, a fishing smack trying to make the harbour; from Dendy Sadler, a couple of Epicurean monks either drinking or eating. The examples could be multiplied, but these will suffice. It rather discounts the interest of a gallery when one can conjure up by the bare mention of certain names what one is going to see.

Yeend King's pictures have always a freshness about them which is welcome. He is very happy in his picture of "Market Morning," showing a couple of pretty peasant girls, with their baskets of produce, about to be punted across the ferry. C. G. Kilburne's "After the Ball" is rather puzzling. The fiddlers are leaving the ball-room, where a pretty girl is sitting in solitary state on the couch. Whether Mr. Kilburne intended to convey that she has fallen in love or out of it, or is disgusted because she has not danced as much as she expected, is impossible to say. As her dress does not appear in the least degree crushed, nor a particle of the lace torn, the "wallflower" theory seems most feasible. J. J. Shannon's portrait of Lady Maude Hooper ought to be called the portrait of Lady Maude Hooper's dress. It is not an example that photographic portraitists would do well to imitate.

Mr. W. L. Wyllie's picture of the Naval festivities at Spithead last July has the look of a coloured photograph about it. The nature of the subject, and the small size of the picture necessitating the drawing of the vessels on an insignificant scale, are the cause. Mr. Wyllie has been seen to far greater advantage. G. A. Story's Pan and Sphinx is out of this painter's beaten track; it is a very charming little picture. E. Blair Leighton has quitted tragedy for light comedy in "Une Matinée Musicale." There is nothing in the latter to justify this course. Plenty of painters can delineate lady and gentlemen musicians doing nothing in particular in old world costumes. F. G. Colman's "Evening by the Willows" is a very admirable rendering of nature in her calmest and most placid aspect.

W. Dendy Sadler's "The Private Secretary," and Frank Walton's "Abenger Mill Pond," are both excellent examples of their respective styles, while Hamilton Macallum's "The Bade Frauen of Heligoland" is one of the most vigorous and refreshing pictures in the exhibition. The grouping and drawing of the comely lasses of Heligoland are admirable. E. F. Brewbrall's "In Kynance Cove" is a clever study of waves, and E. G. Warren's "Wafted o'er a Sunny Land" has the very look of summer. Henry J. Stock's Satan dead at the foot of the Cross" is, to say the least, ugly; while Mr. T. B. Kennyton is certainly not at his best in "Pleasure and Pain."

"Old Balton's Farm" of John R. Reid is a puzzle. It is only after some study that one can distinguish the farmhouse from the figures. The most ambitious picture in the gallery is "The Remorse of Solomon," J. Solomon. The drapery is admirably rendered, but the pose is awkward, and expressive of anything but remorse. The face of an Eastern type, and surrounded by a mass of raven hair, is repulsive, no doubt intentionally so. It is a powerful, but unpleasant picture.

Of the pictures by lady artists may be mentioned Miss Rosa Jameson's humorous "A Vanishing Tail," Mrs L. Jopling's "Imogen," and Miss G. Homan's "A Special Pleader." The latter—hung unfairly, by the way, having regard to its merits—shows much thought in the conception of the subject, and great care in its execution. There is evidence of laudable ambition in the picture, which should bear good fruit in the future.

Notes.

In Vienna there has just been established, under the patronage of the Emperor, an institution for instruction and experiment in connection with photography and reproductive methods in general; the exact title of the institute being "Kaiserliche Lehr und Versuchs-Anstalt fuer Photographie und Reproductions-verfahren in Oesterreich."

Considering that such an able and energetic worker as Dr. Eder has been appointed director, one may hope for excellent results. The school is to open on March 1st next, and those wishing to join should write to Dr. Eder in Vienna.

The first or introductory course commences with free-hand drawing from the flat, and elementary sketching from the solid, after which the pupil will be instructed in geometrical drawing, elementary physics, commercial arithmetic, and book-keeping.

Now the pupil enters upon the more distinctly technical and photogrephic phase of his studies, the second section including more advanced drawing and perspective, with chemistry and physics—this latter having special reference to optics.

Next come photographic chemistry and photography; printing methods, including type work, plate-printing, and lithography, this instruction being followed by special practical courses. Photographic retouching comes at the end of this course.

In addition, there are special courses on the less studied branches of the reproductive arts. As the fees are low, we may expect that many pupils will enter.

We read in the daily papers of the discovery of some records of about 61 A.D., at Pompeii, these records being incised in thin layers of wax upon wooden tablets; but the wax peeled off soon after the tablets were exposed to the atmosphere, rendering the records illegible. This kind of thing shows the need of keeping the camera close at hand during excavation work; indeed, in this instance, some of the more important of the tablets were photographed.

American humourists are fond of poking fun at photography. The latest effort represents the pastor of a chapel informing a friend that his congregation having defrayed the cost, he had consented to be photographed. "And in what position are you going to be taken?" "In an attitude of prayer." Friend: "Eh? Oh, yes, I understand: with your face in the pulpit cushion! That's a very good idea." The satire is not uncalled for. Most photographers agree that the reverend sitter is often the most difficult to deal with. Somehow he cannot get rid of sanctity, and he has a lurking desire to be photographed "not as other men are," but in some pose which shall suggest, and be in keeping with, his calling. As a rule, he is disappointed with his photograph. He does not come out with that angelic expression he had fondly hoped for. He then pleads to be taken in some favourite pose which all his friends recognize. "I am told I have a habit of standing like this when in the pulpit," and he forthwith throws himself into an attitude which would make him a laughing stock if the photographer adopted it.

We recollect being present in the studio of a well-known photographer when a well-known dissenting minister came to be photographed. The whole operation was intensely amusing because the minister's wife, a lady of the strong-minded type, insisted upon helping the photographer to pose her husband, who submitted to her attentions with the submissive air of a martyr. "Now, dear, look at me," said the lady, peremptorily, when the arrangements were complete. The victim obeyed, and the result was an expression of mild meekness. Still, the minister was not pleased with his appearance; he was too like an ordinary man. "No," said he; "I should like to be taken with eyes turned upwards," gazing at a corner of the roof with a most lack-lustre look. "Good gracious, John, how ridiculous!" exclaimed his energetic spouse, much to the relief of the photographer. "You couldn't have a better photograph than the one just taken." "Oh, if *you* think so, my dear, of course I must be satisfied; but I must confess I should have liked something a little more idealized, you know." Of course he resigned himself, and, thanks to his wife, got a passable portrait. The moral of this incident is that when a reverend gentleman is photographed, he should always be accompanied by his wife.

Opinions are divided as to the wisdom of sending proofs on approbation, but the custom is too firmly fixed for early alteration. Yet, it is pretty certain that a proof invites an amount of criticism which the finished photographs rarely call forth. It is instructive to read in an article on Frank Holl, the well-known portrait painter, which last week appeared in the *World*, that "he would as soon think of allowing a sitter to see the unfinished picture as he would of permitting you to peep sacrilegiously behind the screen at the portraits of the celebrities upon which he is engaged." The reason of the objection is akin to the cause of the uncomfortable feeling which seizes the photographer when he sends out proofs. He knows not whether he has pleased the vanity of the sitter, or whether the latter may not have a notion that something better can be obtained. We have heard of persons who have wanted re-sittings, not because they had any fault to find, but because they would like to see how they look in a different pose. If they had been willing to pay for their curiosity, nothing could be said; but they were not.

Those members of the Photographic Society who were present at the meeting held on the 13th inst., and who have read the letter of the Honorary Secretary which appeared in our last, should not fail to read a reply to this letter, which appears on page 830 of our present issue: although in both the letters the discussion is mainly directed to a study of the circumstances which led to the rejection of the minutes by the meeting, rather than upon the circumstances under which a vote on the other side was obtained.

Perhaps one of the best of the view meters is a single telescope of the opera glass type with the lenses reversed—that is to say with the concave glass next the object; but the concave glass must be made extra large in this case, or the finder will only include a narrow angle. From J. H. Dallmeyer and Co. we have just received an excellent instrument of this type, and, indeed, just the kind of thing an amateur wants to give him an idea of a view without setting up his camera.

The two lenses of the reversed opera glass are set at a fixed distance, but the tube containing them slides in another, at the end of which is a rectangular opening homologous with the plates to be used, while on the sliding tube a line is engraved at each point where the area of vision corresponds with one of the lenses to be used; and for every new lens taken into work a new line must be engraved. If, on the other hand, a fresh size of plate not homologous with the first is taken into use, a fresh screen with a rectangular opening homologous with the figure of the new plates must be provided.

Speaking of Dallmeyer, we may refer to one of the most impudent forgeries of his inscription which we have met with. A photographer residing at Cardiff, wishing to purchase a second-hand 2B portrait lens, stated his requirements in an advertisement, and as a result had sent to him, on approval, a very common and old-fashioned half-plate French portrait lens, on which was engraved "Dallmeyers No. 2B Ordinary Quick Acting, No. 1176, London;" indeed, such a lens as one can pick up almost any day for 10s. at a pawnshop. The inscription on a genuine 2B is "J. H. Dallmeyer, London," with the addition of a number.

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PHOTOGRAPHY IN GERMANY.

BY HERMANN E. GUNTHER.

Yellow Films and Screens in Silver Printing—Husnik's Gelatinotype—Colloype or Lichtdruck Plates.

Yellow Films and Screens in Silver Printing.—In my practice I have during many years experienced the advantage of the use of yellow films for retarding the action of light in silver printing. I find a much softer print may be obtained by interposing a yellow screen or a yellow transparent film between the illuminant and the sensitized paper. This is especially the case in platinotyping paintings or other coloured pictures, which I used to take on wet collodion plates. After exposure, development is carried on with the iron developer, but the negative is not fixed, only thoroughly washed out with plenty of water. When dried, the yellow film of the negative which is formed by the silver iodide is directly varnished. The yellow film, being unalterable even in sunlight, prevents the light from penetrating the negative too rapidly, and therefore leads to exceedingly soft, but nevertheless brilliant prints. I am pleased to find these experiments stated by a well known worker, L. Belitzki, of Nordhausen, who quite recently published an article on the subject in the *Deutsche Photographen-Zeitung.* Belitzki uses for this purpose screens of yellow glass, which form a very simple and most effective means for obtaining good prints of agreeable tone from flat and weakly printing negatives. He prepares the screens in the following manner:—To 100 c.c. of absolute alcohol are added 10 grammes of gamboge, the mixture is shaken repeatedly, and after a period of some hours, put aside to settle. Be careful with this solution, on account of the poisonous action of the resinous substance. After settling, the insoluble precipitate is filtered off, and the clear orange-yellow liquid preserved for use; it will keep for a very long time. Of this yellow solution, about one part is added to ten parts of ordinary negative varnish, and with it thoroughly cleaned and slightly warmed glass plates are coated, and the plates dried by heat, in the very same manner as if a negative is to be varnished. The finished glass plate, if examined by transmitted light, should scarcely show any yellowness. It should, therefore, by no means appear so intensely yellow as the yellow screens prepared with aurantia collodion, now commonly in use with orthochromatic photography; though, placed on white paper, it should exhibit a delicate clear yellow colour, without showing any darker yellow spots and streaks, or matt parts, otherwise they would be marked in the print. It is a good plan to prepare some pale yellow screens as well as by adding more of the gamboge solution, some somewhat darker yellow ones. They will keep in use for months; if, however, they begin to bleach in time, they should not at once be rejected, but should be used as paler screens, which still act perceivably on the prints; also if a screen of a certain tone does not act sufficiently, such a partly bleached plate may with advantage be placed over the other one, to slightly strengthen the tone. The intensity of colour suitable for every case can of course not be described; it must be appointed by experience, but it will be soon recognised. Very flat negatives of course require more intensely-coloured screens, or a number of screens, placed one over another; whilst but slightly flat negatives will print well with less coloured screens. It is a great advantage of this method, that it allows one to recognize the suitable tone, and to adapt it to the negatives, much better than by use of ground glasses or of yellow varnish; but especially it is the finer tone of the prints which can be obtained by this method. It is obvious that in using these yellow screens, printing will take a longer time than without using them; but in comparison of the ground-glasses sometimes used for this purpose, there will hardly be any difference as regards time of printing. Negatives requiring only a gentle strengthening may be printed partly by means of yellow screens, partly without them; by this method, any desired effect may be produced. How long these yellow screens will keep may be seen from the fact that they are to be varnished at the most twice a-year. I am sure this method of printing will prove as useful to others as it has to myself.

Husnik's Photo-Mechanical Process, the "Gelatinotype."—In your number of the 16th September, p. 580, you gave a brief description of this new process, which I now supplement by a specimen with which I have been favoured by the inventor, Professor J. Husnik, of Prague.* As he writes, the block is one which has already given about 1,500 prints, it having been before inserted in a German publication. This proves that a very great number of prints can be taken from these blocks without injuring them. The process differs entirely from photo-engraving or zinc-etching. The patentee says: "My invention has for its object the production of permanent gelatine reliefs of sufficient depth, forming most exact reproductions of the subject, especially for the letter-press. This is to be performed by development of the gelatino-bichromate films with a saturated solution of bichromate salts, and this on the exposed side of the film; next by rubbing with a cold liquid, and by repeated exposure and by hardening the relief on its surface and on the sides, and finally by another development of the film. For development I use a saturated solution of bichromate salts, thus a new and still unknown property of the chrome salts coming into employment. These salts, in comparison of the acids, have he advantage not only in dissolving all unaffected parts of the gelatine during development, but also in further hardening the already exposed parts of the image on the copy to be developed, the impression received from the light being increased by contact with the above-named chrome salt solution. By this way the relief allows longer development, and becomes deeper. Another innovation consists in the manner of the second development. I interrupt the first development before the fine parts have been injured, allow to dry, cover the whole parts (the sub-ground with printers' ink diluted with oil of turpentine) with the aid of a fine brush as near as possible to the image, and expose the whole relief once more to light. The relief, having taken up much chrome salt during the first development, has grown very sensitive to light, and hardens, not only on the surface, but also on the sides of the lines. The printers' ink having been removed, the development can be continued once more, and to any desired depth, especially if any larger white parts have before been cut out with a sharp knife." The reliefs are mounted before development by a new method on zinc plates, and these, after the reliefs have been finished, are nailed on to wood blocks. The whole process is much simpler than, for instance, the single operation of transferring copies to zinc for the etching process. As Prof. Husnik writes to me, one person, without any preliminary knowledge, will be able to produce daily more than forty reliefs. Moreover, the cheapness of the material used is remarkable. A square metre of gelatino-bichromate film —a surface by which blocks can be produced valuing about 500 marks—costs only three to four marks. As to the merits of the new invention, the specimen will enable your readers to judge for themselves. I may only add that in my opinion, the process, though the results seem not to surpass those obtainable by the zinc method, will soon come into general use and favour, on account of its rapidity and cheapness.

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* See also the Year-Book for 1888.

PATENT OFFICE LIBRARY

New Method of Obtaining Collotope Plates.—In Liesegang's "Photographischer Almanac fur 1888," a very useful and practical book, Adolf Schwarz describes a process of producing collotype or lichtdruck plates. 1. Preliminary coating with albumen.—30 parts of albumen are beaten to a froth, and mixed with 30 parts of water. To this are added a solution of half a part of bichromate of potash, a solution of half a part of bichromate of ammonium, and a few drops of ammonia. After coating, the plates are allowed to dry spontaneously in an upright position, and, when perfectly dry, they are placed with the prepared surface on a piece of black cloth, and exposed through the back of the plate to diffused light, until the film, in touching it with the wet finger, shows no more inclined to stick to the finger. It will be well to use a photometer for printing, and to write down the numbers reached. 2. Sensitive gelatine preparation.—2 parts of isinglass are cut to very small pieces, and poured over with 25 parts of water, in which they are allowed to swell over night. On the other hand, 8 parts of gelatine (Heinrich's lichtdruck gelatine is to be recommended) are taken and soaked for about an hour in ten times its weight of water. One part of bichromated ammonium is then dissolved, 0·05 parts of calcium chloride added, and the whole placed in a warm water bath. When dissolved, it is filtered. Before coating, the plate must be warmed up to 104°. The coated plate is dried at 122°. After exposure to light the plate is exposed once more to diffused light for one and a half to three minutes, placing it as before, with the prepared surface on a black cloth. Then it is washed out until the yellow colour has disappeared, and hardened in a 1 per cent. alum solution. 3. Etching.—Take a small piece of a lithographic stone and pour it over with a mixture of 1 part of nitric acid and 8 parts of water. There must, however, be an excess of the stone, so that the solution will contain no free acid. It is allowed to stand at least twenty-four hours, when it is filtered; then one part of this solution is mixed with one part of glycerine, and a trifle of potassium permanganate is added. With this mixture the finished plate is covered for half-an-hour, when it may be printed.

PHOTO-MICROGRAPHY.

BY T. CHARTERS WHITE.[*]

Focussing the Object.—The light being as accurately centred as possible, the object may be arranged on the white focussing screen, and that part selected which it is desired to photograph. Being able by this arrangement of mine to see the focussing screen with the greatest ease, this selection can be made without any difficulty, and a certain amount of rough focussing can be done. The white screen can now be removed, and the glass focussing screen may be substituted. Many suggestions have been made relative to the character of this screen, as ground glass is out of the question where fine and complicated detail has to be sharply focussed. That which commended itself to my judgment as being applicable to this purpose has been described by Mr. Walmsley after the following manner:—A sensitive plate being exposed momentarily to daylight is developed to a very slight extent, and not sufficient to give any considerable density. After washing, fixing, and drying, it is to be immersed in a bath of mercuric chloride till it is whitened. This makes a very efficient screen, but is not so satisfactory in my hands as the clear glass I use after this fashion. An old plate may be cleaned, and some fine lines, made by the very light draught of a writing diamond, may be drawn across it at short intervals, a set being also drawn at right angles to these; it is thus roughly divided into squares. This surface must always be placed next the object. To enable us in the semi-darkness of our room to distinguish this surface from the back, it is well to affix to the edges of the back some narrow strips of postage-stamp bordering, which will be sufficient to indicate the difference. The object being illuminated, and having been roughly focussed on the white screen, may now be looked at through the glass plate and focussed till its details are as clearly defined in the focussing glass as are the scratches on the plate; as these are approximately on the same plane as the gelatine film we may be satisfied that we shall get a tolerably sharp negative. If we adopt the plan first suggested for making this focusing screen, we may get the focus absolutely on the right plane if the plates are all coated to the same thickness; but the difficulty of seeing the detail of a pathological subject through even the slightest opacity of such a screen is a hindrance to sharp focussing, and, therefore, does not recommend itself strongly for this purpose, but might answer for coarser detail.

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[*] Continued from page 791.

Exposure.—With this begins our real difficulty, and only several trials can enable us to arrive at the correct time to give, for it not only varies with the objectives used and the distance the plate is from the object, but is also governed by the colour of the object. For instance, take a brown insect, or parts of an insect, and it will be found impossible to photograph more than its outline. Its brown chitinous skin presents a barrier no actinic rays can pierce. Better results can be obtained if the insect has been decolourised by long immersion in turpentine; but although its brown has been reduced to yellow, this affords but a slight amelioration of the difficulty. Insects may be bleached as white as paper by being steeped in a mixture of chlorate of potash and water, to which a few drops of hydrochloric acid have been added, but while this bleaching fluid removes the whole of the colour, it destroys the whole of the internal structure, and so robs the photograph of half its value and beauty. Again exposure is dominated by the staining of a tissue. Staining processes have an immense value to the histologist, as by their means the elements of a tissue can be differentiated in a manner which the highest power objectives are unable to accomplish. But staining may be of two characters. There is the selective staining, by which the nuclei of a tissue, or its growing parts, are, as it were, picked out from those parts which are formed, and in which no active functions are in operation. Now this, however valuable to the microscopist, is detrimental to the photographer, for it is, to say the least, not pretty to see a photo-micrograph of an anatomical or pathological subject dotted all over with the stained nuclei. Luckily, staining may be made general, and it is in this direction we may look for aid in our operations. In this way an unstained section, whether of an animal or vegetable nature, if cut as thin as our previous observations show to be necessary, is so diaphonous that it will not throw an image on the screen, and the subject and the background are so much alike that there is no contrast between them in the resulting negative; but if the section be stained with a general stain it removes this disability, the image of the object being retarded in proportion to the colour and depth of the stain, while the background gets its full exposure. Stains vary in colour, and their influence on exposure and this variation must meet with due consideration at our hands. In practice, I find the blue stains, especially if pale, and the logwood stain, if too lavender, do not give that retarding action necessary to get a good negative, even with the shortest exposure, the image being buried in one uniform density. Carmine stained preparations give very good results. Bismarck brown stained preparations give good negatives, and do not require such a long exposure as many would imagine. It is of very little use to be guided by tables of exposure in this branch, as they can, at best, be only used as an approximation to correctness, and practice and judgment are the only guides upon which the beginner can rely; but the table given by Mr. Walmsley, and which I have before quoted from Nos. 13, 14, and 15 of *The British Journal of Photography* for 1885, will furnish a very reliable guide for those who take up this class of work for the first time, but after that the student should draw up tables for himself, to be modified according to circumstances.

The plan I have adopted for ascertaining the magnification of an object is simple and accurate enough for all ordinary work. The sliding base-board carrying the sensitive plate is marked off roughly into five divisions of about half a foot distance apart. An object exactly one-sixteenth of an inch was chosen, and its image was projected through the lowest power objective intended to be employed, and being focussed on the screen, its dimensions were taken at the first division by means of compass and rule, and its amplification determined accordingly. The sliding base was moved through all its divisions, and the same performance gone through for each of the objectives employed. Now, if the object which we know to one-sixteenth of an inch is magnified at the fifth division to four inches diameter, we call that × 64 and so on for all the objectives and for every class of subject. Thus having, as we have done, determined on the magnification in diameter which every objective will give at every division of the base-board, we are enabled to tabulate these and hang up the table near the apparatus.

There is one thing this apparatus in its present form cannot do comfortably, and that is, photograph opaque objects. It might be made to do that, however, by widening the base-board, and some day it may be further modified to accomplish this. This class of work requires more attention than I can give to it, so I must perforce leave that to others, but I dare say I shall some day feel inclined to add to the apparatus some arrangement by which the light from the lamp can be thrown on to opaque objects on the light from two lamps of differing intensity employed.

Then, again, I might be expected to say a few words relative to the use of orthochromatic plates for photo-micrography. I have used these, both purchased and made, by bathing in erythrosine, and except in double stained sections of plants, have not obtained sufficiently marked results to induce me to get these plates in preference to the usual ordinary kinds.

I have, in these few brief remarks, touched on the cardinal difficulties which beset the path of the photo-micrographer: These may be, to a limited exent, removed, so that they are less obtrusive, by the concentration of many minds on the task, but they can never be entirely overcome, on account of the physical laws involved in their production. In the meantime, however, many of them may be lessened by proper attention on the part of the preparers of microscopical objects by their mounting these as flat as possible, by particular attention to necessary reduction in thinness, and the selection of suitable stains. Thus, insects mounted entire, without pressure and rendered perfectly transparent, are beautiful objects, and eminently suited for examination with a binocular microscope, but are perfectly useless for photography; while, had they retained their transparency and been mounted flat, they would, at least, have conveyed an idea of their form in a photograph. Again, sections are either too thick, not flat, or unsuitably stained. Some sections I recently examined presented in miniature all the beautiful undulations of some rolling downs, instead of that absolute flatness which would ensure a sharp photograph. We may expect an improvement in this department of the photographic art only from the combined operations of the histologist who knows what is required in photo-micrography, and the photographer who knows something of the normal characters of the histological elements. It is at present useless to trust to professional mounters, who do not know or do not care to know the conditions necessary to the making of a successful photograph, and who ought to be, at the same time, in the possession of the knowledge of microscopical anatomy to enable them to put up suitable subjects properly. As an illustration of what I intend to convey, take some of the sections of tongue frequently met with; they usually present a confused, broken up mass of muscular fibre with here and there a piece of glandular structure, and crowned with a range of unimportant papillæ. Now, such a section would be a far more instructive agent if it had been made through a filiform or a fungiform papilla. I need not multiply instances; this one will suffice to exemplify my meaning. Section cutters should always endeavour to include in their sections some important element of interest; then, if cut thin enough and suitably stained, a photograph full of instructive detail will be the result. Life is not long enough for one man to devote his leisure moments, snatched from the business of bread winning, to every branch of this interesting work; therefore, from personal experience, I plead for this division of labour.

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TWENTY RULES FOR SUCCESSFUL WORKING WITH QUICK PLATES.

BY DR. GARRISON, OF CHICAGO.

First.—Examine your camera and tablets or plate holders in sunshine, and if they are not light-tight, make them as nearly so as possible.

Second.—In the dark room lantern or window use deep red glass.

Third.—Examine your dark room, and, if it is not so, make it perfectly light-tight.

Fourth.—If you fill your plate holders for future use, put them in a dark box or closet in the dark room, and in the same or similar place keep your stock of plates, especially those in opened boxes.

Fifth.—For landscapes use a stop not larger than one twenty-fifth the focal length of your lens, and then, if the light is strong, remove and return the cap as quickly as you can.

Sixth.—In the woods the time should be from fifteen to thirty times longer. Early in the morning and late in the day, the exposure should be from ten to one hundred times longer. For portrait work under the sky-light, the exposure should last from half to three or four seconds according to the light used, and in this case the stop must be comparatively large. Some, having excellent lenses, use none at all, in which case the exposure may be instantaneous.

Seventh.—Have your developer ready for use before you remove the plate from the holder.

Eighth.—After covering the plate with developer, hold the tray so that the red light only shines on the plate occasionally.

Ninth.—When you think development nearly finished, lift up the plate and look through it at the red light. If you can see any light through the high lights return it, and continue development until all parts except the deepest shadows are quite opaque, by which time the image will generally be visible, in part at least, on the back of the plate.

Tenth.—Use fresh developer for every plate. Do not waste a plate worth ten or twenty cents by trying to save half a cent on the developer.

Eleventh.—The films of very quick plates being quite transparent, are, and must be, thicker than those of slow plates. Hence quick plates require longer development, longer fixing, and longer washing than slow ones.

Twelfth.—Hypo is cheap. Therefore save time by using a strong solution, and avoid stains by renewing it frequently.

Thirteenth.—Thin, hazy negatives full of detail, but lacking in density and vigour, result from over-exposure.

Fourteenth.—Under-exposure, with full development, gives negatives dense in the high lights, but without detail in the shadows and proper gradation of tones.

Fifteenth.—If development is stopped too soon, the high lights will be thin and the shadows nearly clear glass.

Sixteenth.—Gray fog is due to the action of diffused light at some stage of the process. Green or pink fog is caused by forcing with ammonia. It never occurs with the soda developer.

Seventeenth.—Yellow stains are caused by too much potash or soda in the developer, or by the use of too little sulphite of soda, and finally from the use of old discoloured fixing solution.

Eighteenth.—Frosty appearance of the negative when dry is caused by crystallization of the hypo which still remains in the film. The remedy is to wash again.

Nineteenth.—An excess of pyro favours contrast and density, while an excess of soda (or other alkali) favours development of detail; therefore the careful operator will allow the pyro to be in excess until sufficient density is obtained, and then will force up detail by increasing the amount of soda.

Twentieth.—Pyro in solution is pyro in process of dissolution. It keeps best, however, in a very slightly acid solution. The presence of sulphite of sodium also retards its decay. Salicylic acid is poisonous to bacteria, but does not prevent oxidation, which is the cause of the deterioration of pyro in solution.—*Anthony's Bulletin.*

DUNDEE AND EAST OF SCOTLAND PHOTOGRAPHIC ASSOCIATION.

The following are the particulars relating to the exhibition of photographs, photographic apparatus, and appliances, to be held in the Galleries of the Albert Institute, Dundee, commencing on Feb. 16th, 1888, and continuing open for six weeks.

Conditions.

1. Each exhibitor shall be charged an entrance fee of Five Shillings, for which 15 square feet of wall space will be allowed; extra space charged 6d. per square foot. No charge shall be made for Foreign exhibits. Each exhibitor shall be entitled to one Season Ticket gratis.

2. All pictures for exhibition to be sent mounted and framed, and to have on the back the Artist's name, title of subject, process by which produced, and (if for sale) the price including frame. No name, title, or other particulars allowed on the front, as such will appear in the catalogue; and no Oxford frames will be admitted. Further, the Hanging Committe reserve the right of rejecting any picture or pictures.

3. Photographs coloured by hand, crystoleums and photographs mounted on glass, will be accepted for exhibition only.

4. The works sent for competition must be the *bona fide* production of the exhibitor or his staff. No exhibit which has previously taken a prize at an exhibition of this Association shall be admitted to competition; and no exhibit may be awarded more than one of the Association's medals.

5. The Council will undertake the sale of exhibits at a commission of 10 per cent.; and they will unpack, repack, and return all exhibits unsold, all carriage being paid by the exhibitor. The utmost care will be taken with the exhibits, but at the same time the Society shall not be responsible for any untoward accident, except loss by fire, which is specially provided for.

6. Notice of intended exhibits must be sent to the Secretary on the annexed form A. not later than 31st January 1888; and all exhibits must be sent, carriage paid, in time to arrive not later than 7th February 1888, addressed "Photographic Exhibition, Albert Institute, Dundee;" and form B. should be, at same time, filled up, and sent as letter of advice.

In addition to pictures sent for competition, the Committee will be glad to receive for exhibition any interesting examples of the Photographic art, or apparatus or chemicals connected therewith.

The following is a list of the medals which will be awarded in the various classes by the Judges; subject to a right to withhold any medal in any class on the ground of insufficient merit.

I.—*Portraiture.*—(Class 1). Gold medal for the series of (not fewer than six) portraits, which in the opinion of the Judges, possesses the highest degree of merit, irrespective of size; (2) one silver and one bronze medal for the best and second best series of (not fewer than six) portraits above 8½ by 6½; (3) one silver and one bronze medal for the best and second best series of (not fewer than eight) portraits of 8½ by 6½, or under.

II.—*Landscapes.*—(Class 4). Gold medal for the series of (not fewer than six) landscapes, which, in the opinion of the Judges, possesses the highest degree of merit, irrespective of size; (5) one silver and one bronze medal for the best and second best series of (not fewer than eight) landscapes of 8½ by 6½, or under; (6) one silver and one bronze medal for the best and second best series of (not fewer than six) landscapes above 8½ by 6½.

III.—*Various.*—(Class 7) one silver and one bronze medal for the best and second best exhibit of two or more genre pictures; (8) silver medal for the best ceramic picture; (9) one silver and one bronze medal for the best and second best untouched or retouched enlargement, subject optional, by any process; (10) one silver and one bronze medal for the best and second best untouched or retouched enlargement, subject optional, by bromide process; (11) silver medals for the best transparency or series of transparencies other than lantern slides, (12) for the best series of lantern slides, to be sent in frames of not less than 12, (13) for the best series of not less than 4 instantaneous marine views, (14) for the best series of four or more interiors, (15) for the best picture or series by a photo-mechanical printing process; (all exhibits in this class must be mounted and framed), (15*a*) for the best series of six instantaneous photographs, open to either professional or amateur exhibitors (presented by Paget Prize Plate Company); (16) one silver and two bronze medals to be awarded according to the discretion of the Judges, for improved apparatus, materials, processes, and other meritorious productions.

IV.—*Open to Members only.*—(Class 17) one silver and one bronze medal for the best and second best series of (not fewer than six) landscapes above 6½ by 4¾; (18) one silver and one bronze medal for the best and second best series of (not fewer than six) landscapes of 6½ by 4¾, or under.

V.—*Open to Amateurs only.*—While amateurs can compete in any of the above classes, the following medals are reserved exclusively for them:—(Class 19) one gold, one silver, and one bronze medal for the best, second, and third best series of six landscapes, irrespective of size; to be the work of the exhibitor throughout, except mounting and rolling; (20) open to ladies only—one silver and one bronze medal for the best and second best picture (subject optional), the negative of which has been taken and developed by the exhibitor.

VI.—"*Amateur Photographer*" *Prize.*—One silver and one bronze medal have been presented by the proprietors of the *Amateur Photographer* for the best and second best pictures respectively, under the following conditions:—(1) The photographs must be the work of an Amateur—exposure, development, printing, toning and mounting; (2) the same photographs must not have taken the *Amateur Photographer* prize at any other exhibition; (3) the photographs may be of any variety of land or sea-scape; (4) the judges will pay special regard to the artistic qualities of the work; (5) preference to be given to prints from untouched negatives.

The Judges may also award a special medal to any exhibit of sufficient merit which does not come under any of the foregoing classes.

All communications must be addressed to the Hon. Secretary, James Rattray, 82, High Street, Dundee, N.B.

Arrangements are being made for the appointment of Agents to receive pictures at various centres.

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Patent Intelligence.

Applications for Letters Patent.

17,693. Herbert B. Berkeley, 45, Southampton Buildings London, for "Improvements relating to means for fixing and clearing photographic pictures or images."—[Complete Specification.]—Dec. 23rd, 1887.

Patent which has become Void through Non-payment of the Seventh Year's Renewal Fee.

3702 of 1880. W. Morgan-Brown. (*Pixis.*)—"Coloured photographic prints."

Official Abstracts of Accepted Complete Specifications.

3998 of 1887. Chary. "Miscellaneous."—Artificial light : one or more electric lamps behind sitter with reflectors in front.

16,003 of 1887. Willis. "Printing, colouring, and finishing."—Platinotype : phosphates dispensed with, and lead or mercury salts added to paper or developer.

2,634 of 1887. Bishop. "Miscellaneous."—Collapsable dark room lantern : red cloth cylinder distended by coiled spring, and compressed into stand for packing.

16,125. Albert. "Engraving and etching."—Photo-etching : transfer paper coated with gelatine containing resinous powder is exposed, and transfer made to plate ; developed, and plate heated to melt resin to form resist.

Specifications Published.

1681. William Willis, of Bromley, in the County of Kent, Manufacturer, for "Improvements relating to photo-chemical printing." Dated February 2nd, 1887.

The patentee says :—

My invention has for its object the production, upon paper or other surfaces, of photographic pictures or images in platinum, that is to say, pictures or images of which the colouring matter or pigment is platinum. It differs from the processes of photo-chemical printing described in the specifications of my former patents, viz. :—No. 2011, dated June 5th, 1873, No. 2800, dated July 12th 1878, and No. 1117 dated March 15th 1880, in which processes (as far as they relate to platinum) the paper or other surface is coated with a solution of a salt of platinum and sometimes other salts and also with a solution of ferric oxalate. These solutions are applied, either separately or mixed, to the paper, and in all cases the sensitive coating of the paper contains a salt of platinum and ferric oxalate. After exposure to light, the prepared surfaces are treated with one or the other of the developing solutions described in the said Specifications.

Hitherto no means have been known by which the salt of platinum could be employed entirely in the developer or developing solution, instead of wholly or partly in the sensitive coating of the paper or other surface as above set forth. I have, however, now discovered a process by which I can accomplish this result. For this purpose I apply to paper or other suitable material which has been rendered sensitive by a coating of ferric oxalate and afterwards exposed to light, a developer containing salts of platinum and certain soluble phosphates (or other salts, in which the ferrous oxalate image produced by exposure to light is insoluble or nearly so), with or without the addition of potassic oxalate, potassic tartrate, ammonic citrate or other salts which tend to increase the rapidity and vigour of the development.

By this process I avoid the necessity of using salts of platinum in the sensitive coating of the paper or other surface. I thereby greatly diminish the cost of the process, and can obtain good results without heating the developer.

Moreover I obtain a slower developing action, so that it is possible to watch the progress of development and to arrest it at any desired moment by washing the print in a solution of acid.

According to my present invention I use paper, wood, woven fabric, or other material the surface of which I prepare and render sensitive for photographic purposes by the application of a coating or coatings containing ferric oxalate with (or without) the addition of a salt of lead or of mercury, or mixtures thereof, and without any salt of platinum.

I first prepare the paper or other surface by the use of this coating, as hereinafter specified. I then expose it to light under or behind a negative, and then develop the picture by means of one of my improved developing solutions hereinafter specified, or other suitable solution containing a salt of platinum.

For preparing or coating the paper or other material, I employ for ordinary purposes an aqueous solution of ferric oxalate containing in each fluid ounce about sixty (60) grains of ferric oxalate $Fe_2(C_2O_4)_3$; but I may use less or more of the latter, according to the result desired to be obtained. I am of course aware that there are other salts of iron sensitive to light, but the oxalate is the best for my purpose. I sometimes mix or dissolve in the ferric oxalate a salt of mercury or of lead, or a mixture of these salts : for instance, I dissolve in one fluid ounce of the ferric oxalate solution above described, from one grain to three grains of mercuric chloride. Or I apply solutions of a salt of lead or mercury or a mixture of these salts to the paper or other surface either previously or subsequently to coating the same with ferric oxalate. I find the mercuric salt very useful where a warm tone or effect somewhat resembling that of sepia is desired.

I do not confine myself to aqueous solutions of the above named salts.

The paper thus coated, after being dried, is ready for use. If two coatings are applied to the paper or other surface, it should be dried between the application of the first and second coatings. After its exposure to light under or behind a negative, I apply to it the developing solution.

I prepare an improved developing solution or developer as follows—that is to say, I use solutions of various soluble phosphates. I have been most successful with the following, viz., the monosodic or disodic, the monopotassic or dipotassic, or the mono-ammonic or diammonic orthophosphates, or mixtures or combinations of these salts with one another, and with or without the addition of other salts, such as potassic oxalate, ammonic citrate, and others. In all cases, I add to these solutions or mixtures of solutions a salt of platinum. I mix a solution of this salt with the above named solutions, or I dissolve the platinum salt in them. The platinous salts most suitable for my purpose are the ammonic, potassic, and sodic chloro-platinites, the ammonic potassic and sodic bromo-platinites or mixtures of them, and in some cases I use a very small quantity of a platinic salt, such as ammonic, potassic, or sodic chloro-platinate.

I usually prepare this developing solution as follows, that is to say :—I dissolve in one fluid ounce of water, one hundred (100) grains of di-potassic orthophosphate, forty (40) grains of potassic oxalate, and ten (10) grains of potassic chloro-platinite ; or I may make it in another manner, viz., by dissolving in one fluid ounce of water, one hundred (100) grains of diammonic orthophosphate thirty-five (35) grains of ammonic citrate, and ten (10) grains of ammonic chloro-platinite ; or I make similar developing solutions with the salts previously mentioned. I make also developers containing only phosphates and salts of platinum, that is to say, I may make a developer by dissolving in one ounce of water, about one hundred (100) grains of mono-potassic or di-potassic orthophosphate or mixtures of these salts, and ten (10) grains of potassic chloro-platinate.

The developing solution is applied to the paper or other surface (after the same has been exposed to light) by pouring it over the same, or by immersing the paper therein, or by floating the paper thereon, or by means of a brush or otherwise. It is applied cold, warm, or hot as desired. A cold solution usually takes longer to effect the development of the picture than a hot one. The strength of the solution may be varied ; usually the best results are obtained by strong solutions of the phosphates and other salts ; the platinum salt will ordinarily be used in the proportion of from five to ten grains of the salt to one fluid ounce of the developer.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I wish it understood that I claim—

First. The process or method in which I sensitise the surface of paper or other material by the means herein specified, then expose the surface to light, and then develop the picture or image by the use of a solution containing a salt of platinum, as above set forth.

Second. The production or development of photographic pictures or images in platinum by the application of a salt of this metal to a surface which has been previously rendered sensitive by the application of a ferric salt and exposed to light.

Third. Paper or other material which has its surface prepared and rendered sensitive for photographic purposes by the application of a ferric salt and a salt of mercury or of lead, or of both mercury and lead as above set forth.

Correspondence.

THE OPTICAL CENTRE OF A LENS.

Sir,—Had I not felt convinced that a belief in the actual existence of an "Optical Centre," to which inconsiderate generalization had ascribed properties beyond the theoretical limits of its definition, had gradually been gaining ground among photographers, that it was a real stumbling block in the way of forming correct ideas, and a hindrance to an intelligent apprehension of the optical conditions actually present in photographic lenses, which might become much more serious if supported by the Birkbeck Lectures, I would certainly not have troubled you with so long a letter as my last.

I must demur to the identification of this doctrine with the general teaching of elementary text-books, not knowing any in which quite such sweeping statements are made. I have just referred to Potter, the only text-book I can just now consult, and in his first volume confined to elementary propositions, I find (Art. 71) Prop., "The incident and emergent rays, corresponding to a ray within the lens whose direction passes through the centre, are parallel; or a ray passing through a lens whose direction within the lens passes through the centre has no deviation." Thus, nearly all photographic lenses, and particularly meniscus lenses, whose optical centre is specially referred to as outside the lens, are excluded by the text-book from the broad generalisation objected to.

Indeed, elementary optical text-books do not lend themselves kindly to broad generalisations. It is unfortunate for those who study them, in order to know something of photographic optics, that they are (perhaps necessarily) so unsuited to their requirements, that after going through a whole course they may yet have gained but a slender modicum of such practically useful information as they desired; nay, may be on some points rather misled than otherwise. Such students may still be as far as ever from understanding why one form of lens gives distortion and another is free from it; why the field covered by one is comparatively flat, while another shows great convexity; why one shows a flare spot when stopped down, though another has no such defect; why one form bears a large stop, or even the full aperture, but will never accurately depict a wide angle of view—not even if the lenses are put nearer together and stopped down—while another will accurately depict a wide angle with a small stop, though indistinct all over with a really large one.

The fact is that our elementary text-books have been practically stationary for more than half a century, and have not only never recognised the new conditions required for photographic work, or rendered practicable by improvements in the manufacture of achromatic lenses; but even the results of Airy's investigations, and the work of Coddington (re-written in 1829) have scarcely ever found any place in ordinary text-books; while in popular treatises the explanation is generally wrong. (I remember one bright exception, the chapter on telescopes in Denison's "Astronomy Without Mathematics.") For these text-books are mainly intended for mathematical training; even the hints which might guide the student in his application of the theorems to practical cases being very few, and then not always reliable. And the mathematical treatment of these parts of the subject being very difficult and complex, is only to be found in very advanced treatises, or in separate papers. Those who can consult the edition of "Coddington's Optics" published in 1829 can profit by the much fuller explanations given by the enthusiastic "Father of Modern Optics." But the work is scarce, and so little known (though I have seen it recommended in your columns) that on enquiring for it yesterday at the Bodleian Library I found it still wanting, as it was when I remember asking for it twenty-six years before. Of course the further problems presented by photographic lenses are like a new world. One consequence of this has been that conditions of refraction other than centrical, *i.e.*, than using the whole lens in transmitting rays from a given point in the object to its corresponding point in the image, so that the axis or central ray may pass through the centre of the lens (a condition only possible in a photographic lens when using the full aperture without any stop, and then only in the exact centre of a combination, or over a very small part of the image produced by a single lens), are not really explained in any popular work I am acquainted with. Nevertheless, without the study of excentrical refraction, and of the various effects of obliquity on excentrical pencils, the performance of photographic lenses can never be correctly understood. Consequently, if a few fundamental ideas are extracted from elementary works treating almost exclusively of centrical refraction, they are naturally likely to mislead, as I fear has often happened. How far it has done so in the present case I would respectfully leave to the consideration of your readers.—I am, Sir, yours truly,

W. H. Wheeler.

THE PHOTOGRAPHIC SOCIETY.

Sir,—I also very much regret Mr Donkin's absence from the last meeting of the P.S.G.B., for I might have saved him from the annoyance of indorsing statements which are readily disproved.

I do not dispute that the names of all the candidates were distinctly read out by Mr Donkin, but the simple question remains, "Was he justified in including in the list the name of any candidate against whose nomination a formal written protest had been duly lodged, without calling attention to the fact?" His reply to this is that no protest had come to his knowledge; hence, obviously, his difficulty in understanding the drift of the words quoted, "——— is a mistake;" and I am glad to find that he is, therefore, personally exonerated from all blame in this matter. He only succeeds, however, in shifting the onus on to other shoulders. It need be no surprise to Mr. Donkin that no black balls were found in the ballot box, as none of those who were aware of the protest (and there were several) for one moment imagined that the name of the candidate to whom objection had been taken would be run in with some forty others. I may add that I personally had no opportunity of voting, owing to my having left my seat to speak to Mr. Donkin on the subject, and, before I had time to return thither, all candidates were declared "duly" elected, although Mr. Donkin says "there was no attempt to hurry them through."

I was correctly reported to have stated that I handed in a written protest to Mr. Cocking late in the afternoon of the day of meeting; and, in order that there shall be no possible mistake in the matter, I will enter into details of what then occurred.

Notwithstanding Mr. Cocking's attempt to account to Mr. Donkin "for the whole of his time from 5 o'clock till 6 45, &c.," and thus inferentially deny receipt of the protest, I did, undoubtedly, at his request, occupy his own seat at his desk at or about 5 p.m., he at the time standing at my elbow, and then and there sign the nomination forms for several candidates, during which process I came upon the name of the candidate in question, which led me to ask Mr. Cocking who he was. He replied, and, I believe, with truth, that he did not know. I then said, "If he is, as I have reason to believe, connected with ——, I shall enter a protest against his nomination." Mr. Cocking appeared somewhat excited at my strong expressions of disapproval of the candidate, and, after a few minutes' conversation, he produced a half-sheet of paper, upon which I wrote the protest, laying it upon the top of the pile of nomination forms in his presence. All this took place—and was witnessed by two gentlemen, neither members of the Society—and yet Mr. Cocking assures Mr. Donkin "That he has no recollection of seeing Mr. Wollaston at all till then (viz. 8 o'clock), or of receiving any document from him!" Comment is needless.

I submit, Sir, that it is clearly the duty of the officers of the Society, and not mine, to ascertain what became of the document which was duly lodged in the hands of the only official of the Society in attendance; and, failing the production of the same, or an explanation satisfactory to the body of members, it is my intention, upon public grounds, to demand a re-nomination of the proposed member, in order to give any member the opportunity, if he so desire, of exercising his right to vote "aye" or "no" in this particular.

I do, and shall ever, question the legality of the second vote (under coercion), that the minutes of the meeting of Nov. 8, as entered, were correct; for, as a matter of fact, they were not.—I am, Sir, yours faithfully,

Lennie, Chislehurst. S. G. Buchanan Wollaston.

DUNDEE EXHIBITION.

Dear Sir,—Will you kindly allow me to point out to your readers, through your columns, the fact that the date for receiving entries for the above exhibition has been altered, in response to the expressed wishes of many intending exhibitors, to the 31st of January?

As the greater part of the space is already applied for, it would, however, be advisable that those who have not already entered, should do so as soon as possible.—Yours truly, James Rattray, Hon. Sec.

82, *High Street, Dundee, 24th December.*

Proceedings of Societies.

Photographic Society of Great Britain.

At the technical meeting of this Society held on the 27th inst., W. England occupied the chair.

W. F. Donkin showed some lantern slides developed with hydrochinone, according to the following formula, which was nearly the same as an older one, except that a small quantity of metabisulphite of potash had been substituted for a large quantity of sulphite of soda.

Solution A.—	Hydrochinone	60 grains
	Metabisulphite of potash ...	½ ounce
	Water	8 ounces
Solution B.—	Sodium carbonate	5 „
	Water	40 „

To 1 part of A add 3 parts of B. The slides were of good rich black colour, and had been produced upon gelatino-bromide plates commercially prepared for lantern and transparency purposes. The developer, of which some that had been used for three or four dozen slides in succession, was shown, and was not discoloured, and did not appear to be spoiled either by keeping or by developing so many plates. The development was slow, averaging half an hour, but the shadows remained very clear, and it could be strongly recommended.

W. H. Hyslop had used a similar developer with success, but enquired whether, if the plate were over-exposed, and the development consequently shortened, a disagreeable greenish-yellow colour resulted.

W. F. Donkin: Yes. The use of sulphite of soda also gave a bad colour, which the metabisulphite of potash prevented.

In answer to enquiry as to the actual exposure given, he stated that the slides shown were diminished from negatives of about twice the diameter, and that the camera had been pointed to the sky and exposed with a rapid rectilinear lens without a diaphragm for about half a minute.

In answer to further questions it was stated that the developer worked well with paper negatives.

W. H. Hyslop had, with the hydrochinone developer, exposed plates for from 16 to 120 seconds, and upon development they had all come out good alike, simply taking them from the solution as soon as the image was developed. It answered well for stripping films. The colour was also good, and there was less tendency to fog than with pyro. With sulphite, however, instead of metabisulphite, the hydrochinone gave a disagreeable greenish colour.

The Chairman agreed that the colour was very nice.

W. Bedford enquired whether F. Donkin had tried metabisulphite with pyro for comparison.

W. F. Donkin: No; with pyro he had used sulphite.

Col. Noverre showed papers from which films had been stripped; a faint image of the negative was left upon the paper. He thought it due to the action of the pyro developer producing insolubility of part of the substratum, which, becoming stained, showed itself.

W. H. Hyslop suggested that the image was due to the pressure employed in squeegeeing the film.

W. Bedford suggested that the Society should go into the question of a standard method of marking lantern slides. A very good plan was to place two white spots of paper on the front, one at each top corner—the spots served as guides when placing the slide in the lantern; they were put at the bottom and nearest the light. It would also assist demonstrators with the lantern if the producers of slides would depart from the practice of binding always with black paper. If different colours of binding paper were used, and each exhibitor kept to one colour, the work would be much easier.

The Chairman, having asked W. H. Hyslop to give some description of his method of working when taking instantaneous views of yachts, he replied that the great secret was to be a yachtsman oneself; all his success was due to that fact. Whenever he went out on these occasions, he went to the captain of the vessel and asked to be allowed to take the helm. When they saw that he knew what he was about, they would go much nearer the yachts he wanted to photograph than they would for a landsman.

The Chairman enquired at what distance he preferred to photograph.

W. H. Hyslop replied, at not more than a hundred yards. He used a single lens of thirteen inches focus, and worked with an aperture of $\frac{f}{11}$ on 18 by 14 plates. He did not expose while the vessel on which he was, was under weigh, on account of the vibration, he had the machinery stopped, and then exposed whilst still under weigh, but without the jarring of the engine.

After some little discussion on the magnesium flash light, in the course of which C. Shepherd stated that he had obtained the best result when working with 25 grains of gun-cotton to 20 grains of fine magnesium powder, the meeting was adjourned.

Camera Club.

An exhibition of lantern slides was given at the Camera Club on December 22nd, pictures being shown by Messrs. Dresser, Mason, Davison, Gale, Hussey, Finney, and England. Mr. Dresser's slides were on gelatine bromide plates (chiefly Fry's), the subjects being animals at the Zoological Gardens. Mr. Mason's and Davison's were of landscape and seascape, also on gelatine dry plates (Mawson's). Mr. Gale exhibited a selection of his wet collodion work from those recently adjudged the medal at the Pall Mall Exhibition. Mr. Hussey's slides were some collodio-bromide (Brook's emulsion) and some gelatine bromide, and included excellent landscape work. Howard Finney showed gelatine chloride transparencies, and Mr. England's slides made on specially rapid chloride plates. These plates were said to be so fast as to permit of reduction in the camera.

The lantern was worked by Messrs. Hussey and Lyonel Clarke, and Mr. Hussey employed a new regulator (introduced by Mr. Oakley) upon his oxygen bottle.

The subject for Jan. 5th is "Pheidias and Photography." Paper at 8 p.m., by Rev. F. C. Lambert.

London and Provincial Photographic Association.

A meeting of this Society was held on Thursday, the 22nd inst., at Masons' Hall Tavern, Coleman Street, J. Traill Taylor in the chair.

The HON. SEC. announced that the Dundee and East of Scotland Photographic Association would open their exhibition at Dundee on Feb. 16th next.

NORMAN MACBETH read a paper entitled "Construction and Requirements of Portrait Art." The lecture was illustrated upon the lantern screen with numerous examples of good, and unsuitable, effects and proportions in portraiture.

In the discussion which followed, the Chairman pointed out that the 50 by 100 size recommended by the lecturer bore analogous proportions to the 5 by 4 size used by photographers. Sizes were to an extent controlled by plate manufacturers. The 7 by 5 size spoken of by the lecturer was a standard size in America. He (the Chairman) employed a 5 by 8 camera, which covered this. Did Mr. Macbeth consider a window placed at an angle of 45° to confer any distinct advantage?

NORMAN MACBETH: No; for any purpose the vertical window is to be recommended.

The CHAIRMAN, speaking of platforms, remarked that these were sometimes made to rotate with the sitter, so that more or less of the posed figure could be presented to the camera.

The LECTURER said that as such platforms were circular, they would become apparent in full-length portraits, whereas square platforms were not so.

F. A. BRIDGE, having complimented the Lecturer, said he was very much impressed with the effect of light obtained in Mr. Macbeth's Edinboro' studio. The light came from above the cornice, and from the west. It was the finest he had seen.

The CHAIRMAN said that the late J. G. Tunny fixed his blinds at the bottom of the studio, and drew them upwards as the lecturer advised.

NORMAN MACBETH controlled his light very much by a roll of canvas, which enabled him to get a dark background when desired, or very broad effects. His Edinboro' studio was twenty two feet high. In London, however, one had to take just what they could get.

The CHAIRMAN: Approximately, Mr. Macbeth's arrangement would form a tunnel studio.

F. A. BRIDGE had seen a tunnel effect obtained by heavy curtains suspended on rails traversing the length of the studio.

W. M. ASHMAN believed many of the points laid down by the lecturer had been adopted by portraitists in their everyday practice. In busy studios very little time could be given to composing a picture, the operator being expected to do his work quickly and well; but when time was available, every care was taken to produce an artistic result. He thought many backgrounds now used detracted rather than added to the artistic value of a picture; as, for instance, one shown on the screen, where a sharp angle was strongly marked close to the head of the subject.

A. COWAN agreed with the last speaker as to the need of quickness in studio practice. All the operator could do was to look at the sitter, and do his best under the circumstances.

The CHAIRMAN had heard good accounts of a low-pitched studio. Reutlinger, of Paris, at one time did excellent work in that way.

A. COWAN considered the effects of lighting would be most pronounced.

J. HUBERT preferred to admit light at the side and from behind the sitter to get atmosphere and solidity. Light coming from the front produced flatness. The backgrounds near shadow should be light and dark besides strong light in order to get stereoscopic effect.

A. COWAN considered electric light par excellence.

W. COBB thought it most reprehensible for the photographer to interfere with sitters by twisting them into a position.

Experience with hypochlorite of zinc as a hypo eliminator was asked for, but none present had tried this agent for the purpose.

A. C. Edwards and E. G. Platt were elected members of the Society.

Talk in the Studio.

THE NEWCASTLE EXHIBITION.—In the Photographic Department an award of a silver medal has been made to P. M. Laws, of Newcastle, for vitrified, ceramic, and enamel photographs.

NORMAN MACBETH'S PAPER ON THE REQUIREMENTS OF PORTRAIT ART.—This paper, referred to above, as read before the London and Provincial Photographic Society, was received from the Secretary's representative too late for insertion this week, but it will appear in our next.

COURSE OF LECTURES AT THE FINSBURY TECHNICAL COLLEGE.—On Wednesday evening, January 18th, at 7.30 p.m., R. Meldola, Professor of Chemistry at the College, will commence a course of about six lectures on Photographic Chemistry. The fee for the course is 6s.; Apprentices half-price. The course will include the following among other things: The Physical and Chemical Actions of Light, Recent Researches on the Photo-chlorides, the Latent Image-Developers, Accelerators and Restrainers, Collodion, Albumen, and Gelatine Processes, Silver and other Printing Processes, Orthochromatic Photography. A full syllabus can be had on application at the College.

PHOTOGRAPHIC CLUB.—The subject for discussion on Jan. 4th, 1888, will be "Winter Photography."

To Correspondents.

⁂ Communications intended for the Editor, and books for review, should be sent under cover and addressed, "The Editor, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C.;" while Advertisements and Business letters should be forwarded to "PIPER and CARTER, PHOTOGRAPHIC NEWS, 5, Furnival Street, London, E.C."

⁂ We cannot undertake to return rejected communications.

S. W. W.—You will see that the matter has been attended to.

DRY PLATE.—1. We suppose the solution to consist principally of hyposulphite of soda, but possibly with the addition of glycerine or sugar. 2. Not quite as much vigour; and one need scarcely say that such plates would not be materially influenced by the treatment first referred to, as this would virtually be a repetition. As regards the theories of the question, we have no matured views, but the facts are clear.

SUBSCRIBER.—Methylated spirit applied with a soft broad brush will destroy the fungoid growth, and it may be well to dissolve a little camphor in the spirit.

JOHN PENNINGTON.—The report has been made use of, and we are much obliged to you for your promise regarding the future.

T. N. M. C.—The most likely place we know of is a book-binders' material shop, near the middle of Bride Street, E.C.

C. W.—No photo-block process can be depended upon as showing "every line and every mark," as the block itself must have a grain or be covered with a system of lines. You had better write to D. C. Dallas, of 9, Furnival Street, E.C.

S. PORTER.—Yes, they are well worth burning for the silver in the ash.

K. BALDWIN.—We were aware that the work had been done by the London Stereoscopic Company, and we are glad to have your opinion as to the quality of the resulting negatives.

W. H. HARRISON.—The continuation to hand, and it will appear next week.

R. JAMESON.—1. This is a point upon which we should hesitate to give an opinion, even if we were well acquainted with all the circumstances. You had better consult a solicitor who has had experience regarding the special point at issue. 2. Neither will answer quite satisfactorily as far as our personal experience goes, but by the use of ten drops of strong ammonia to each ounce we have overcome the difficulty. 3. It is a business matter regarding which you had better consult the accredited agent in this country. If you write direct to the American house they will probably refer you to the London agency.

The Photographic News.

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